FIG. 1

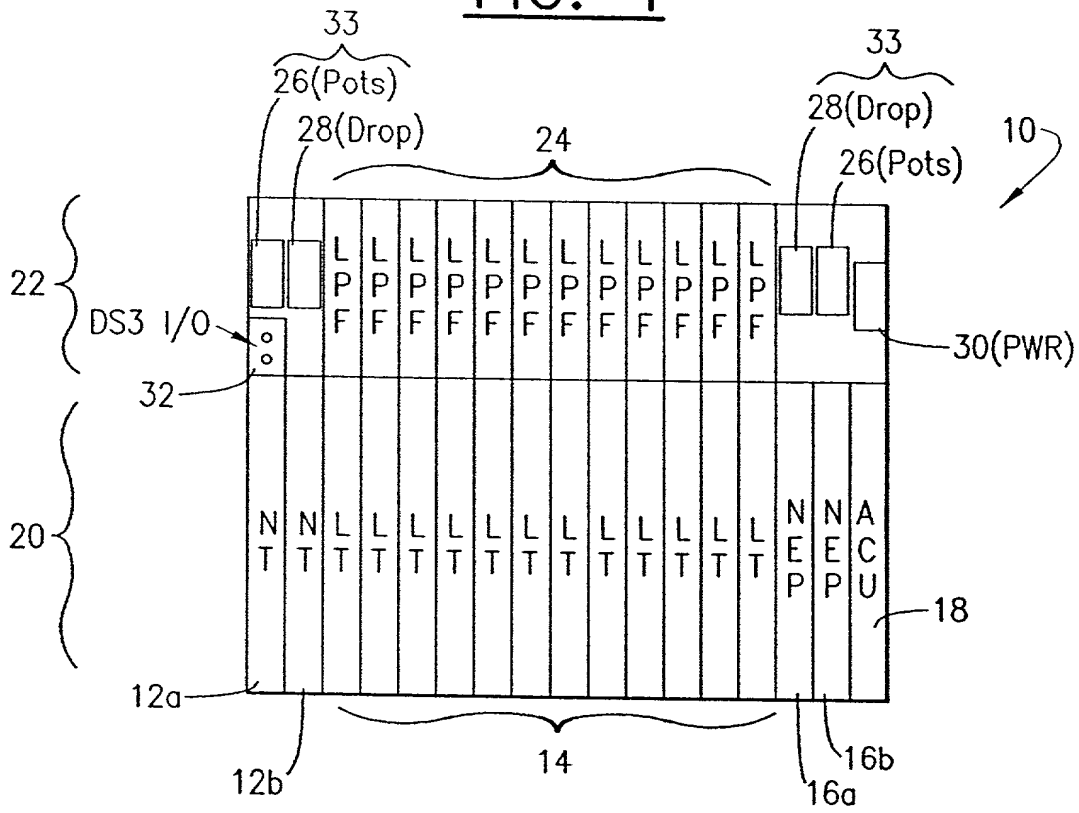

33
26(Pots)
28(Drop)
24
33
28(Drop)
26(Pots)
10
22
DS3 I/O
32
30(PWR)
20
NT
LT
LPF
NEP
ACU
18
12a
12b
14
16b
16a

FIG. 2

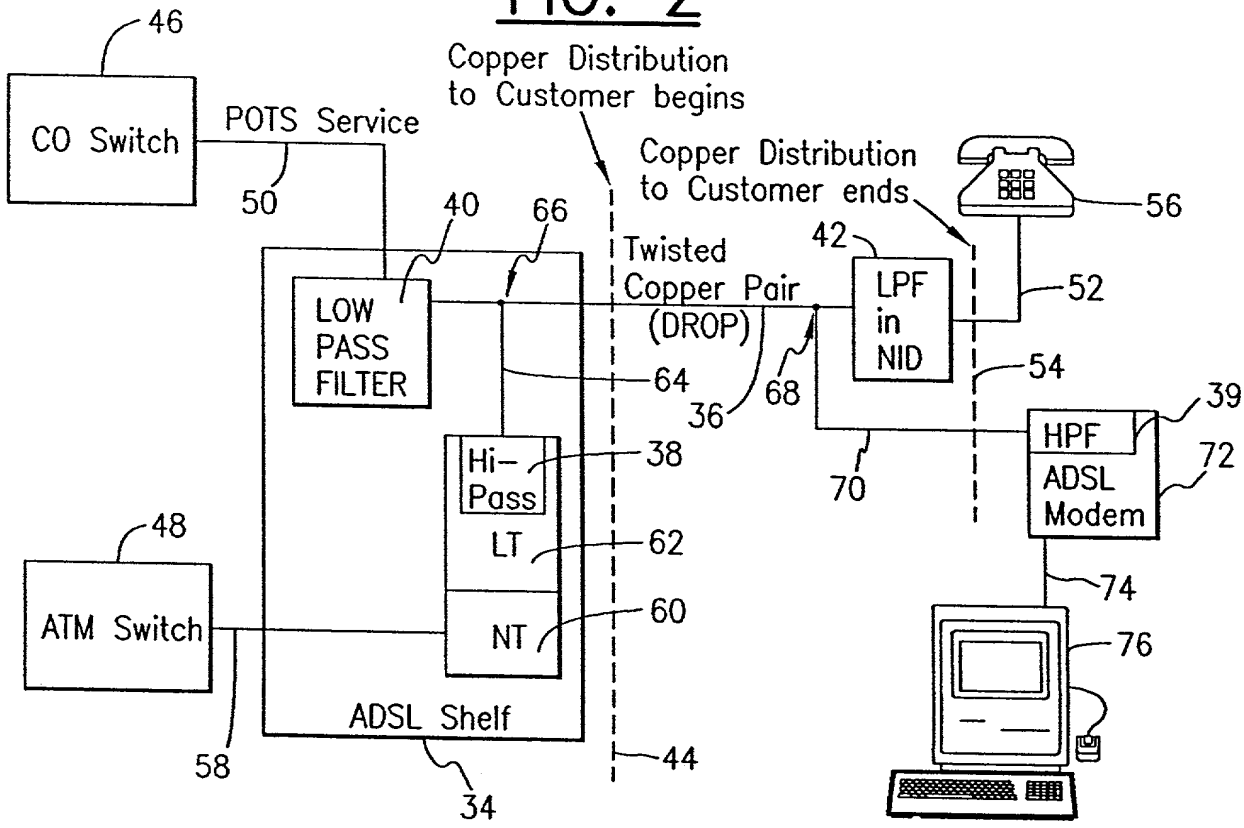

46
CO Switch
POTS Service
50
Copper Distribution to Customer begins
Copper Distribution to Customer ends
56
40
66
42
Twisted Copper Pair (DROP)
LPF in NID
52
LOW PASS FILTER
64
54
36
68
39
HPF
ADSL Modem
72
70
Hi-Pass
38
LT
62
48
ATM Switch
NT
60
74
76
ADSL Shelf
58
34
44

FIG. 1A

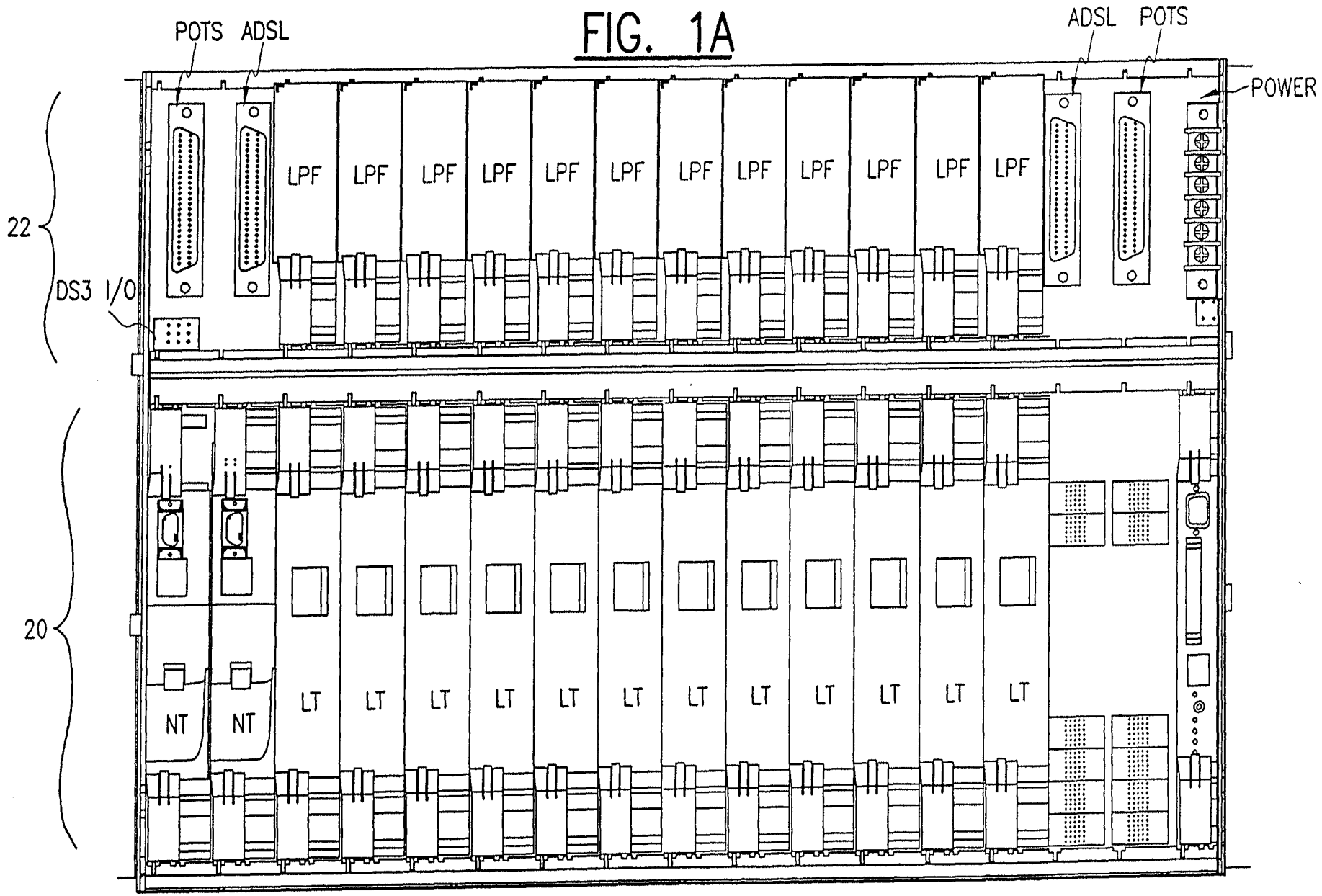


FIG. 1B

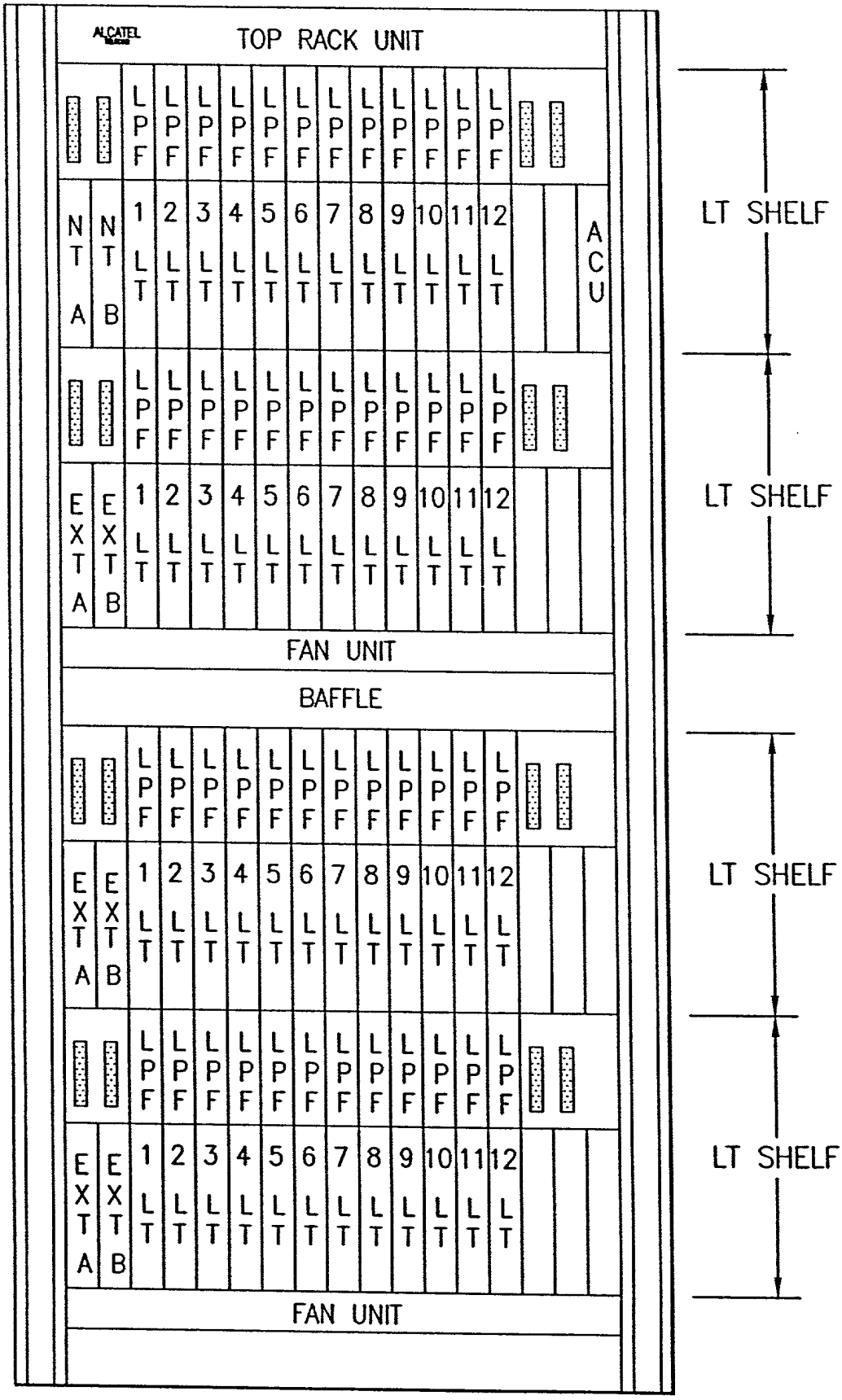

ALCATEL
TOP RACK UNIT
LPF
NTA
NTB
1 LT
2 LT
3 LT
4 LT
5 LT
6 LT
7 LT
8 LT
9 LT
10 LT
11 LT
12 LT
ACU
EXTA
EXTB
FAN UNIT
BAFFLE
LT SHELF
LT SHELF
LT SHELF
LT SHELF

FIG. 1C

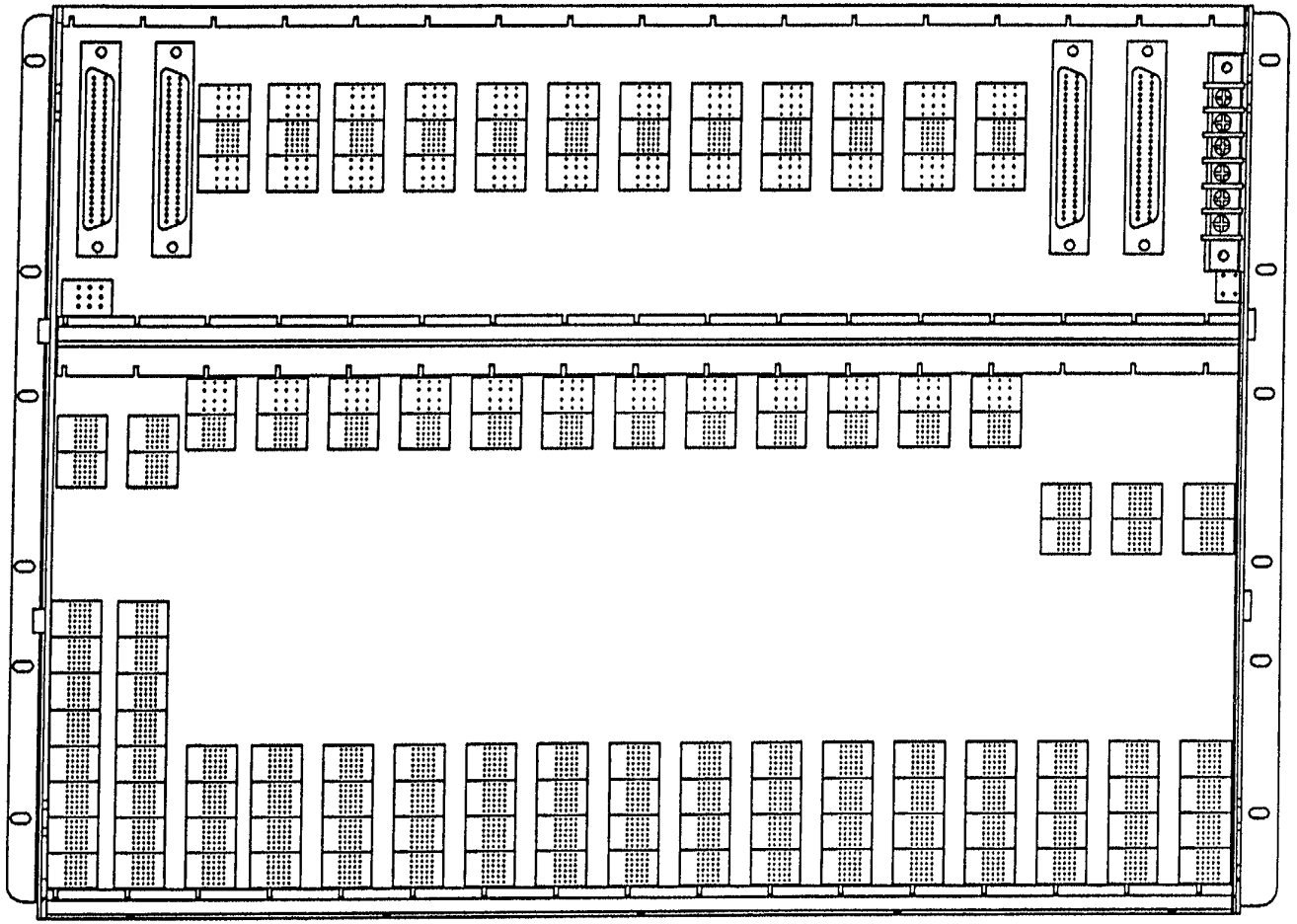


FIG. 1D

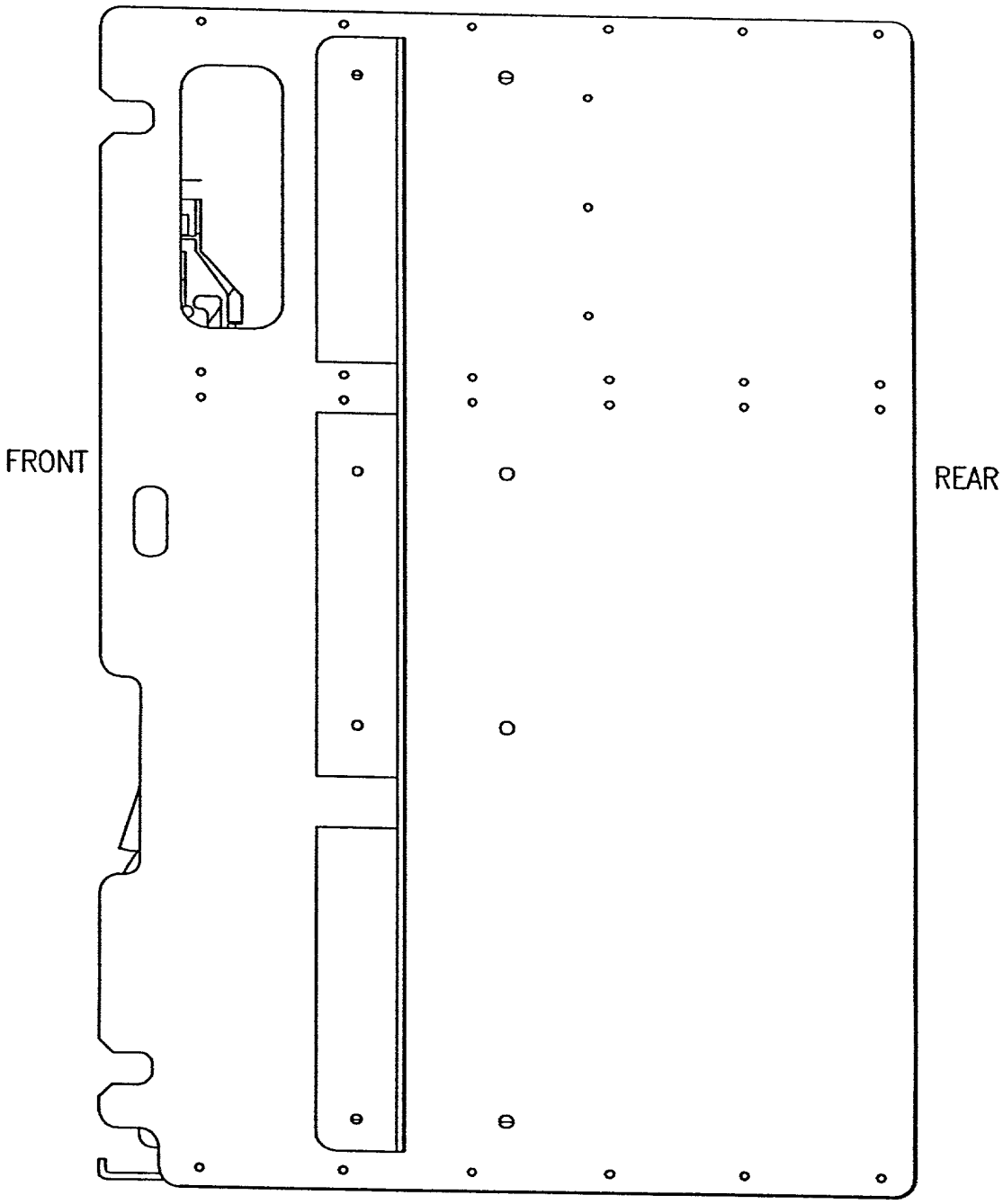


FIG. 1E

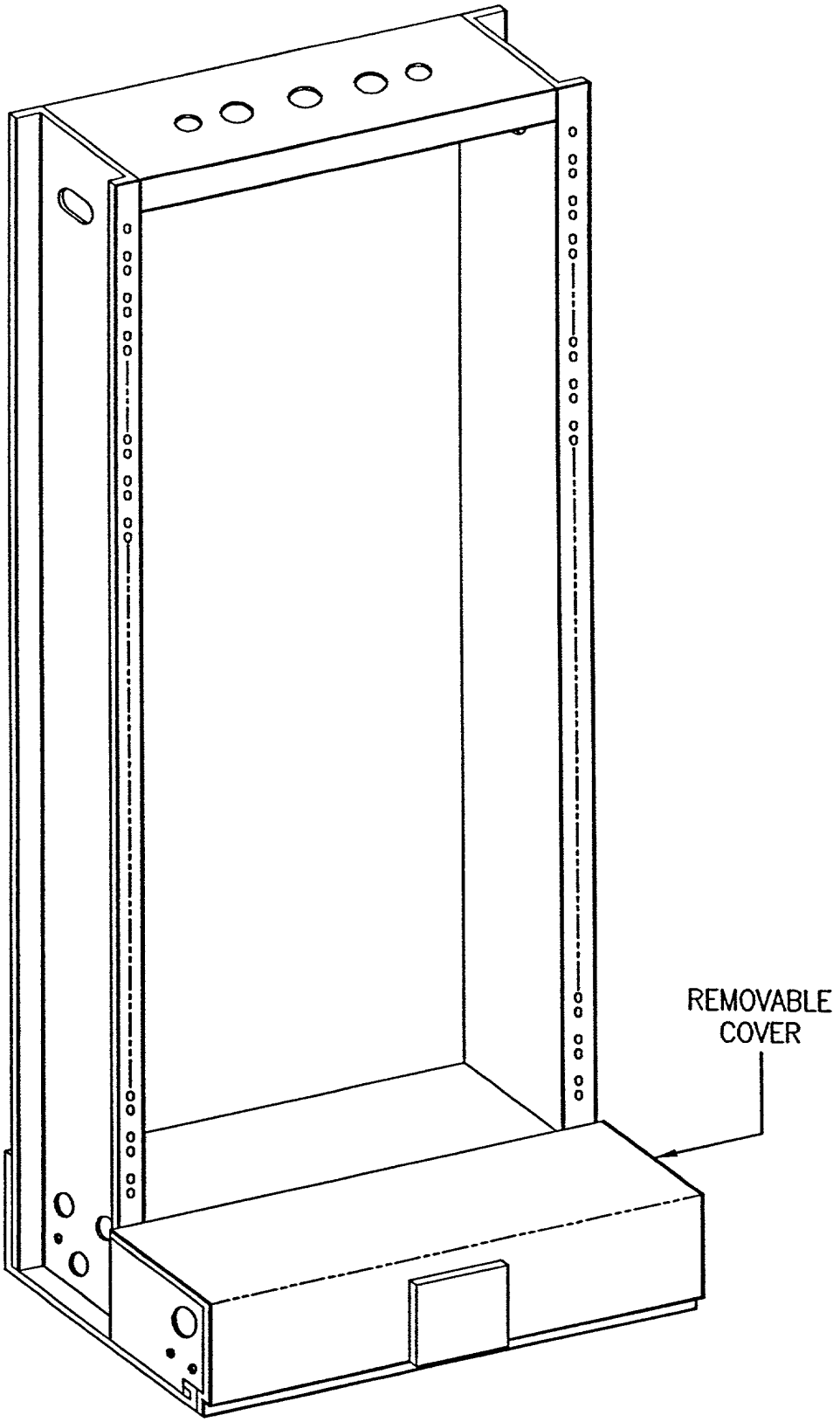
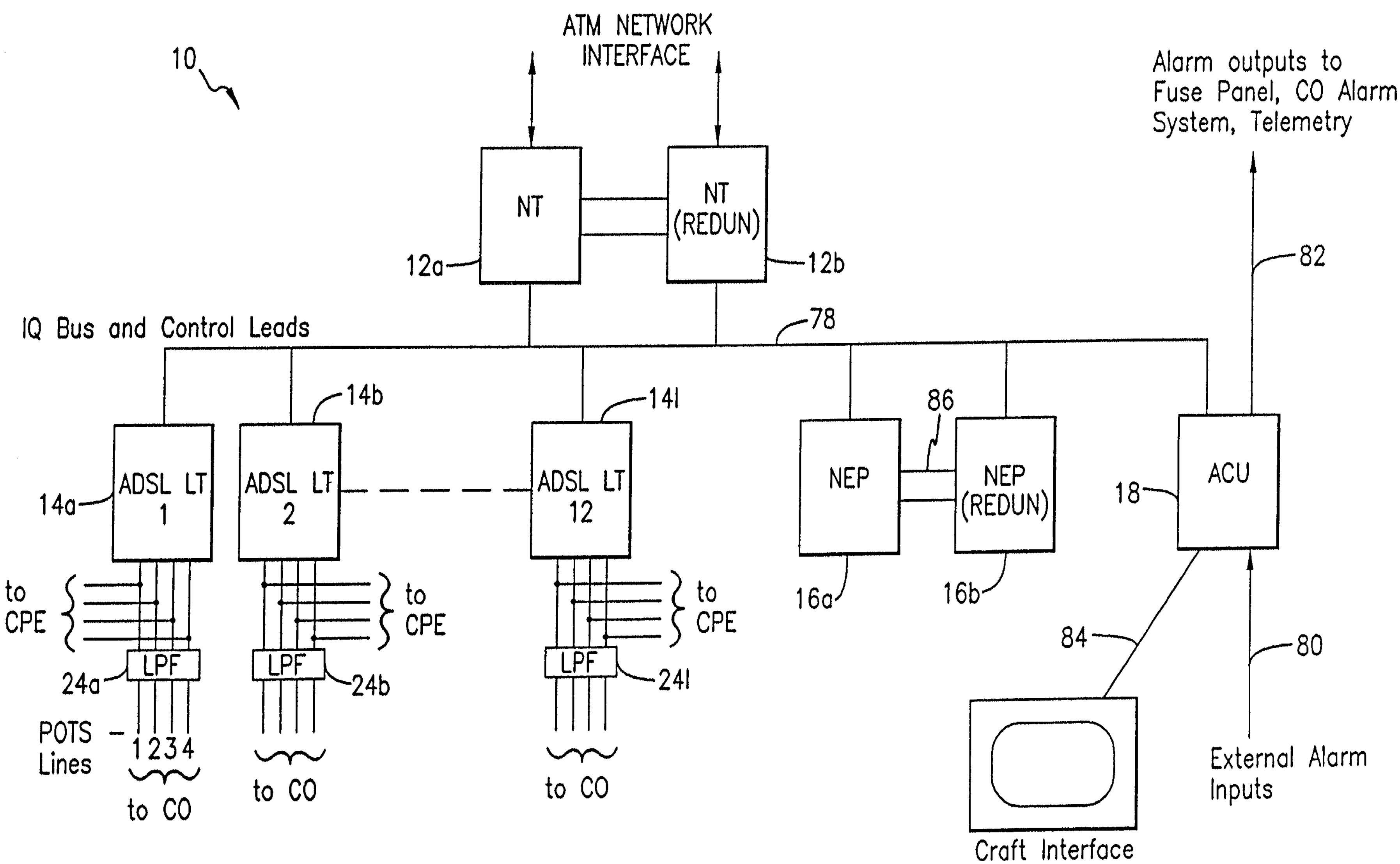


FIG. 3



10
ATM NETWORK INTERFACE
NT
NT (REDUN)
12a
12b
Alarm outputs to Fuse Panel, CO Alarm System, Telemetry
82
78
IQ Bus and Control Leads
14b
14l
86
ADSL LT 1
ADSL LT 2
ADSL LT 12
NEP
NEP (REDUN)
ACU
14a
18
16a
16b
to CPE
to CPE
to CPE
LPF
LPF
LPF
24a
24b
24l
84
80
POTS Lines
1 2 3 4
to CO
to CO
to CO
External Alarm Inputs
Craft Interface

FIG. 3A

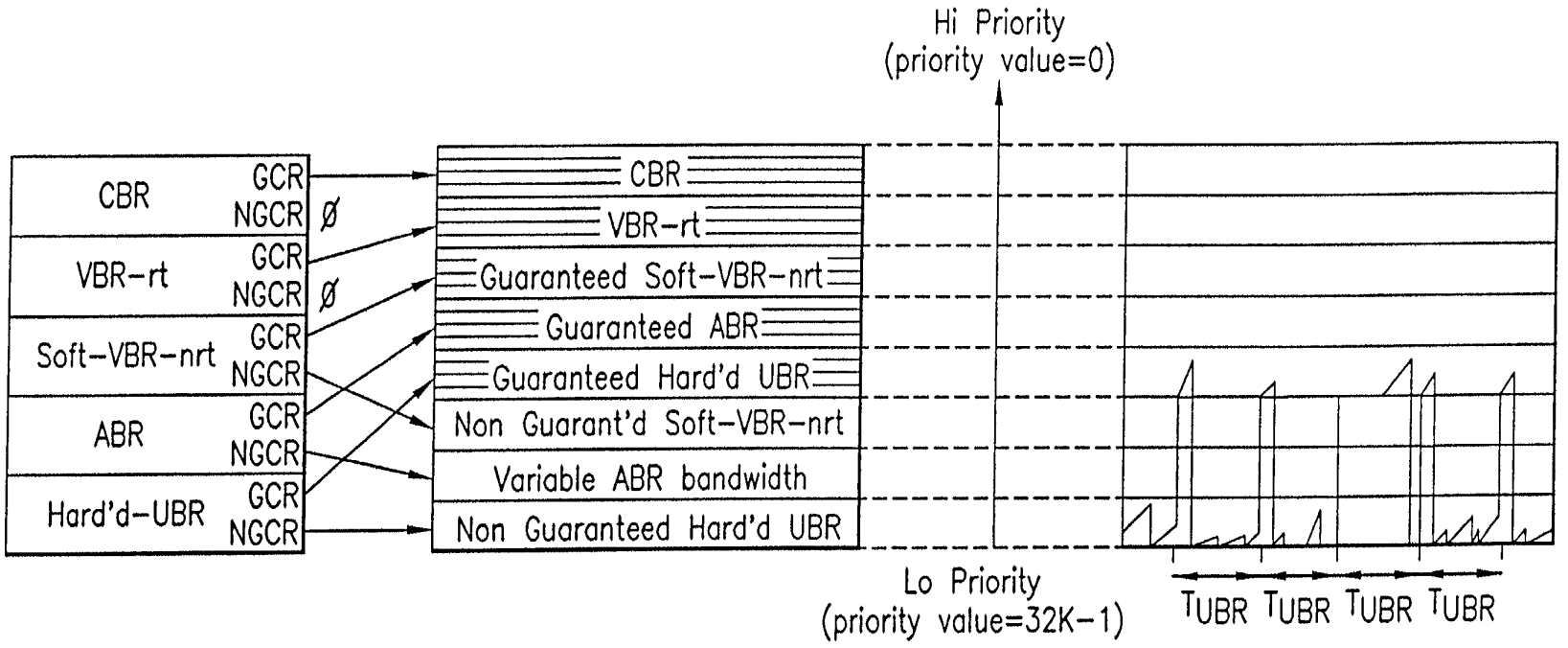


FIG. 4

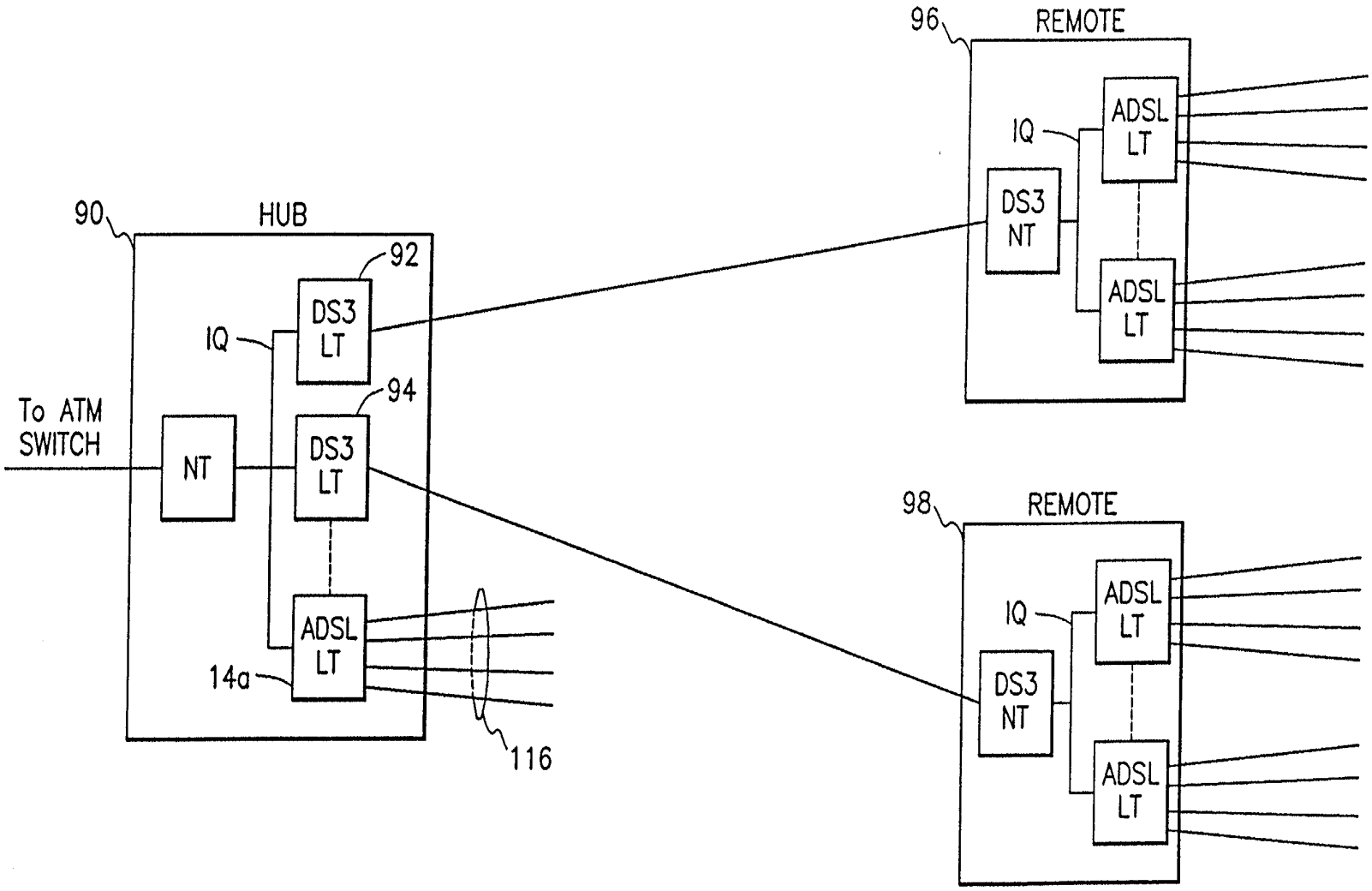


FIG. 4A

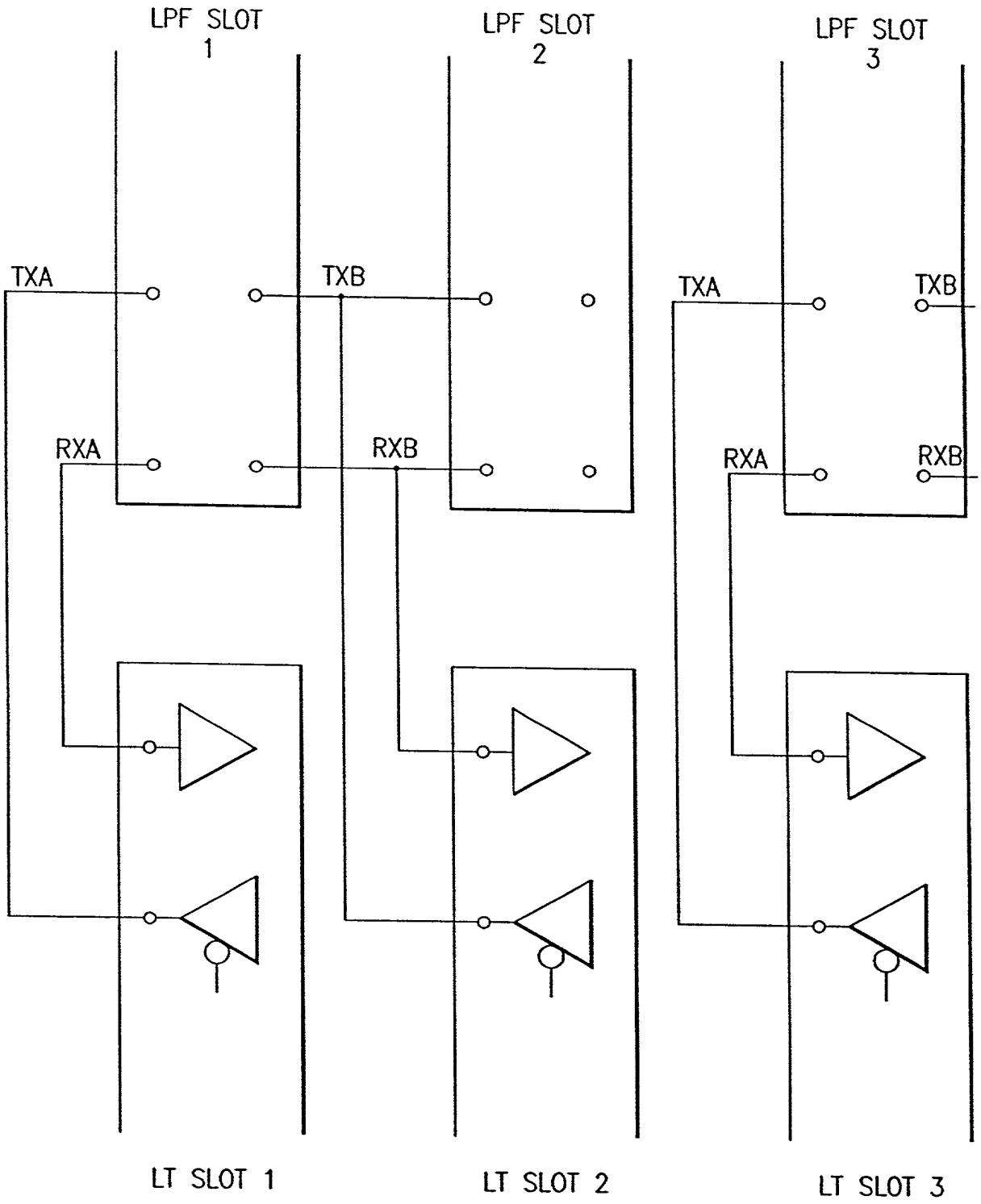

LPF SLOT 1
LPF SLOT 2
LPF SLOT 3
TXA
TXB
TXA
TXB
RXA
RXB
RXA
RXB
LT SLOT 1
LT SLOT 2
LT SLOT 3

FIG. 4B

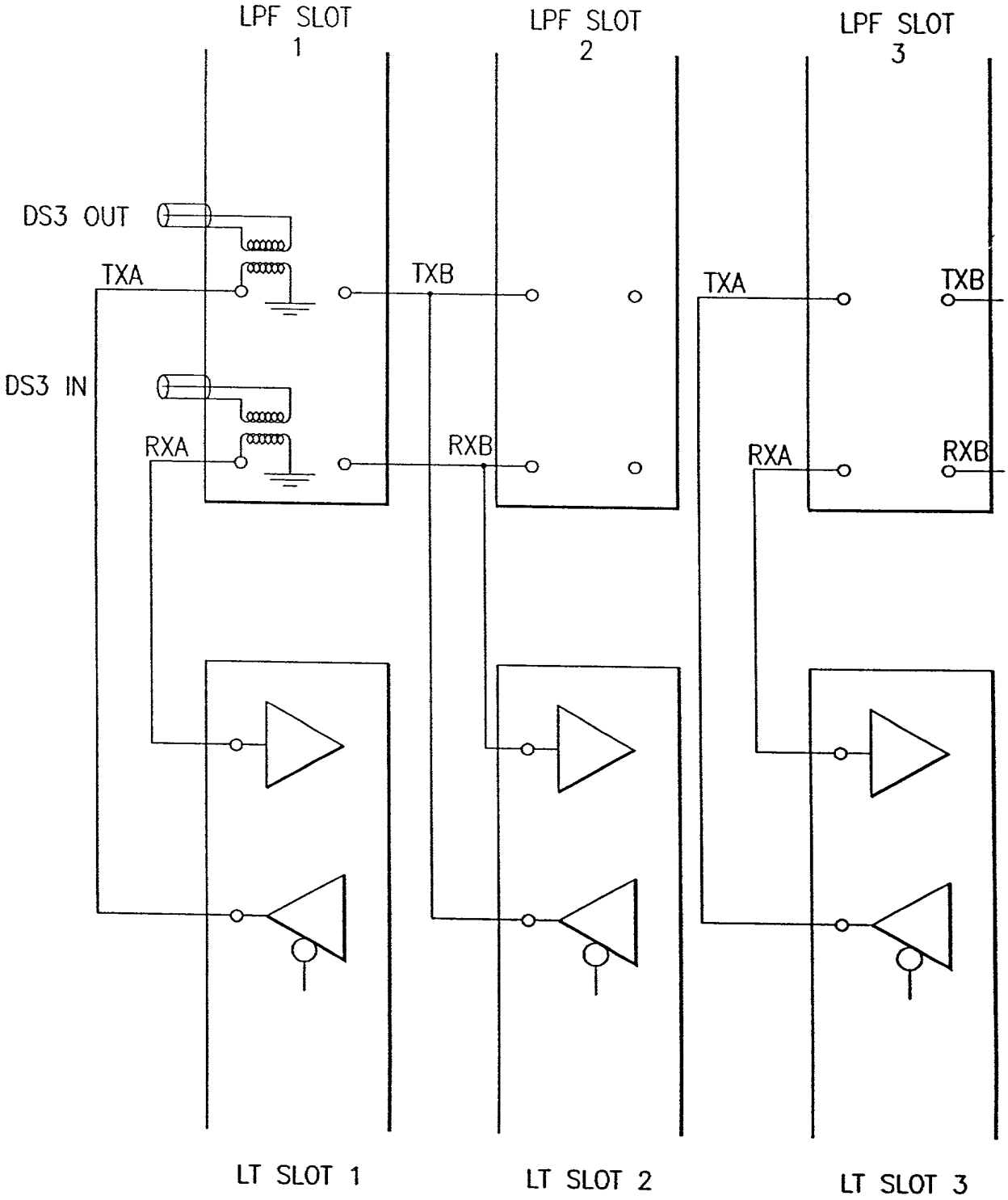

LPF SLOT 1
LPF SLOT 2
LPF SLOT 3
DS3 OUT
DS3 IN
TXA
TXB
RXA
RXB
TXA
TXB
RXA
RXB
LT SLOT 1
LT SLOT 2
LT SLOT 3

FIG. 4C

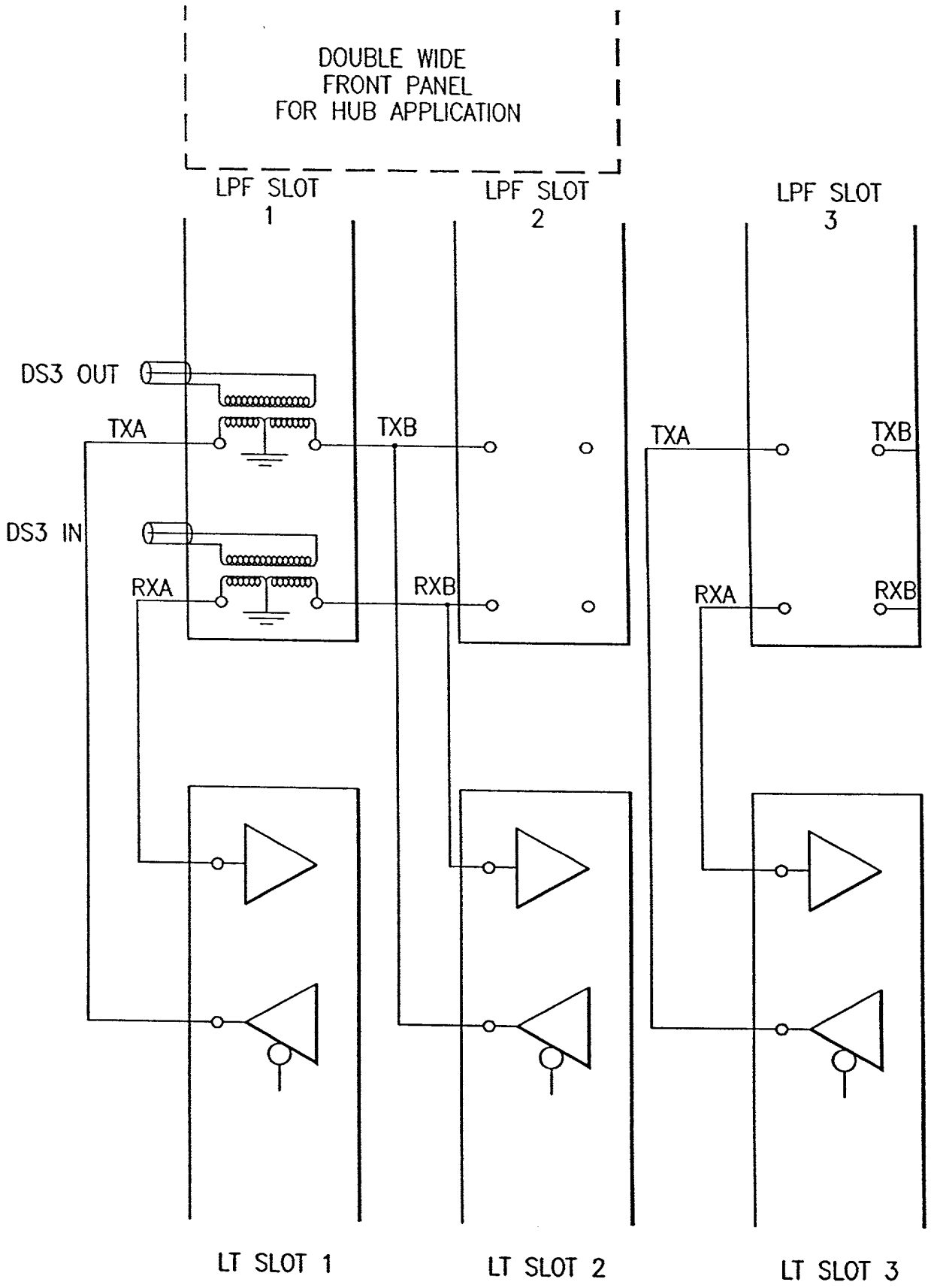

DOUBLE WIDE
FRONT PANEL
FOR HUB APPLICATION
LPF SLOT 1
LPF SLOT 2
LPF SLOT 3
DS3 OUT
TXA
TXB
DS3 IN
RXA
RXB
LT SLOT 1
LT SLOT 2
LT SLOT 3

FIG. 4D

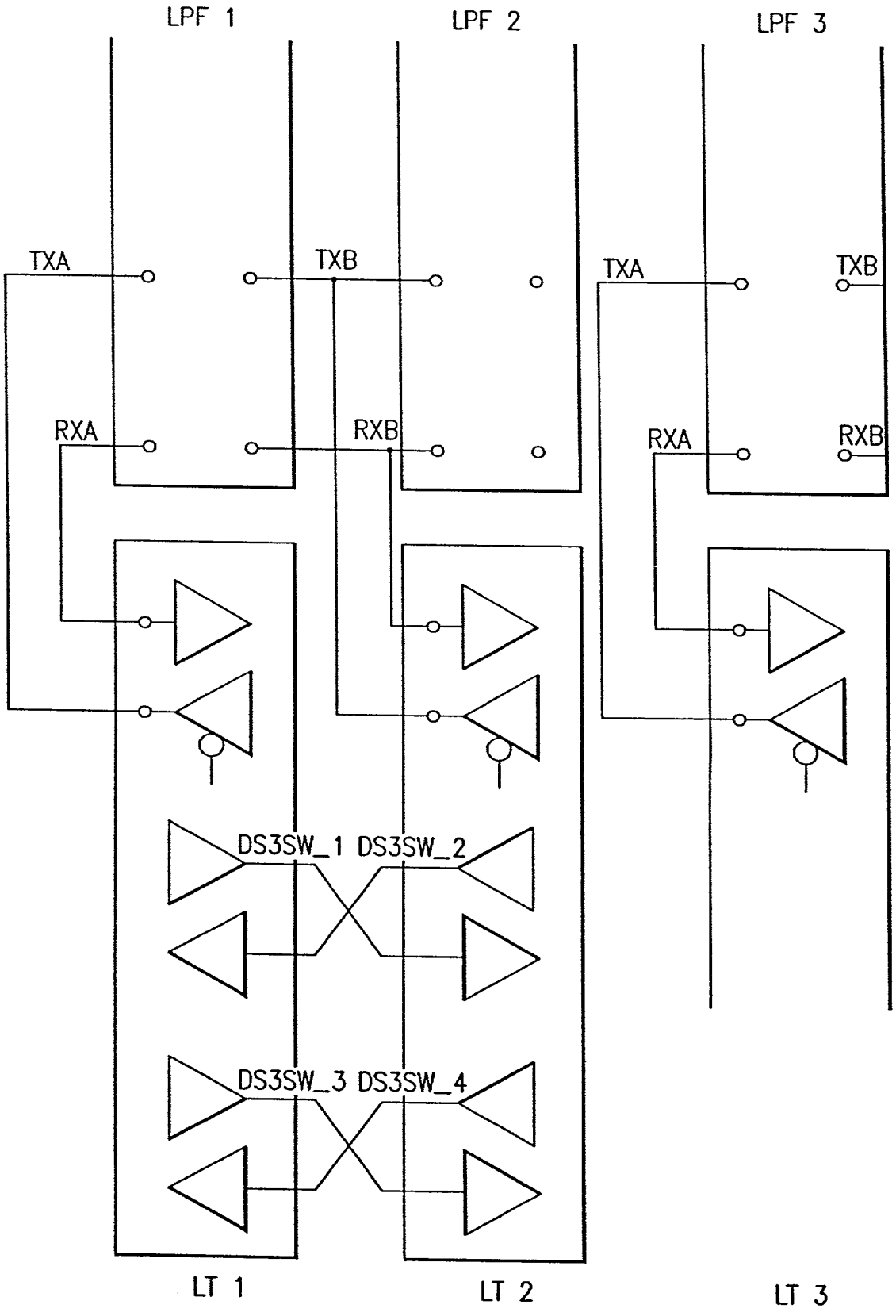

LPF 1
LPF 2
LPF 3
TXA
TXB
TXA
TXB
RXA
RXB
RXA
RXB
DS3SW_1 DS3SW_2
DS3SW_3 DS3SW_4
LT 1
LT 2
LT 3

FIG. 4E

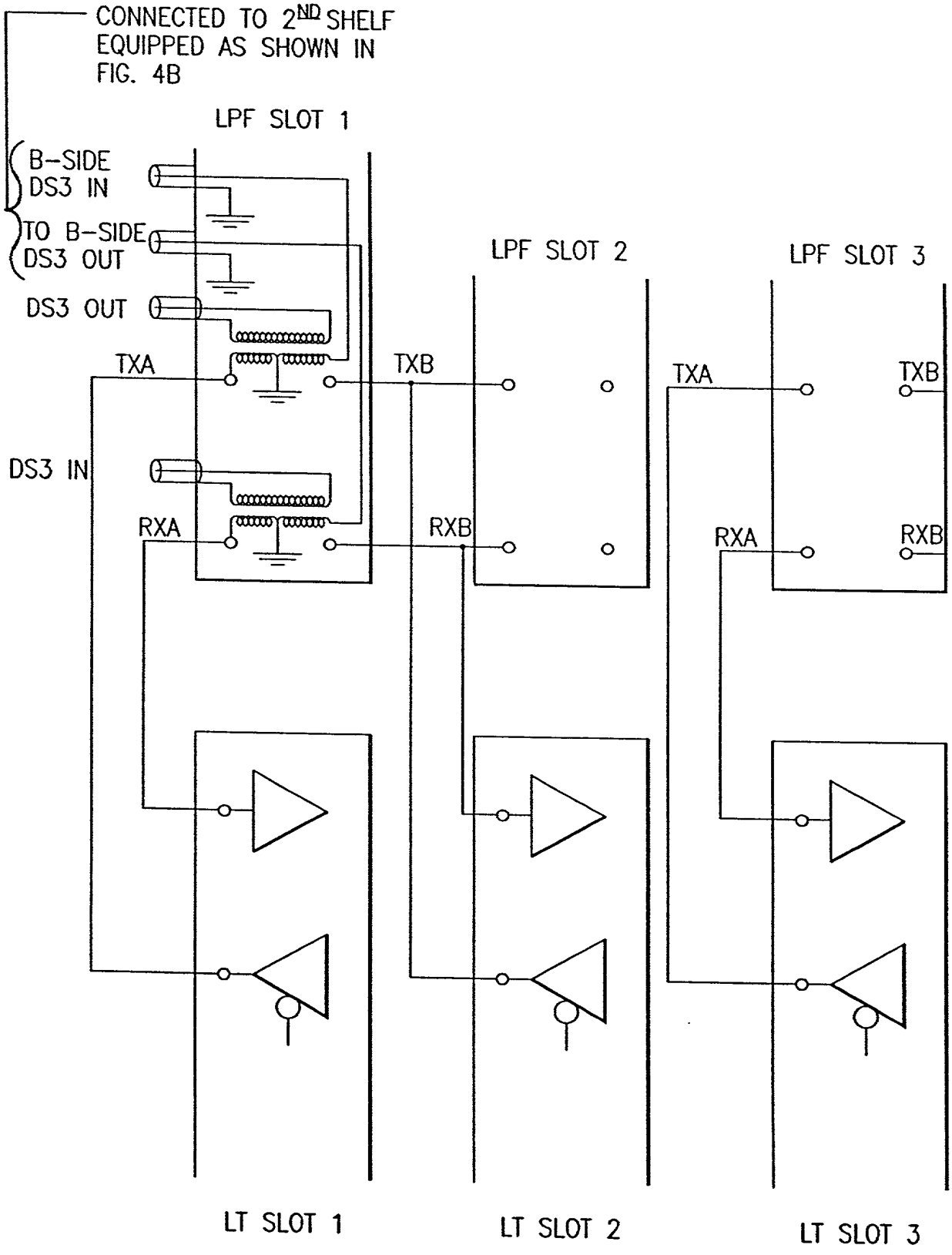
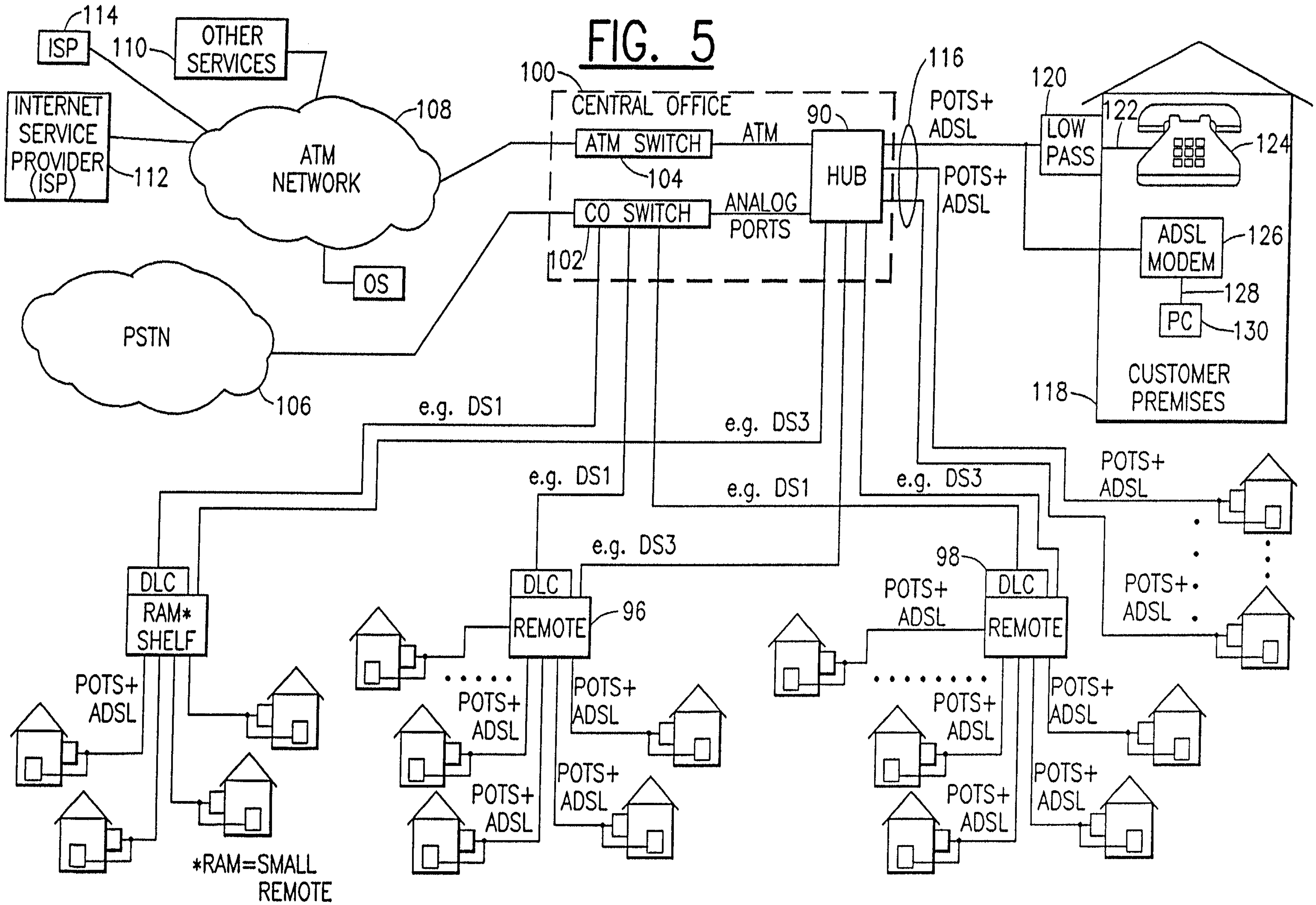

CONNECTED TO 2ND SHELF EQUIPPED AS SHOWN IN FIG. 4B
LPF SLOT 1
B-SIDE DS3 IN
TO B-SIDE DS3 OUT
DS3 OUT
TXA
TXB
DS3 IN
RXA
RXB
LPF SLOT 2
LPF SLOT 3
TXA
TXB
RXA
RXB
LT SLOT 1
LT SLOT 2
LT SLOT 3

FIG. 5



ISP
114
110
OTHER SERVICES
INTERNET SERVICE PROVIDER (ISP)
112
ATM NETWORK
108
OS
PSTN
106
100
CENTRAL OFFICE
ATM SWITCH
104
ATM
CO SWITCH
102
ANALOG PORTS
90
HUB
116
POTS+ ADSL
120
LOW PASS
122
124
ADSL MODEM
126
128
PC
130
CUSTOMER PREMISES
118
e.g. DS1
e.g. DS3
e.g. DS1
e.g. DS1
e.g. DS3
e.g. DS3
DLC
RAM* SHELF
DLC
REMOTE
96
98
DLC
REMOTE
*RAM=SMALL REMOTE

FIG. 6

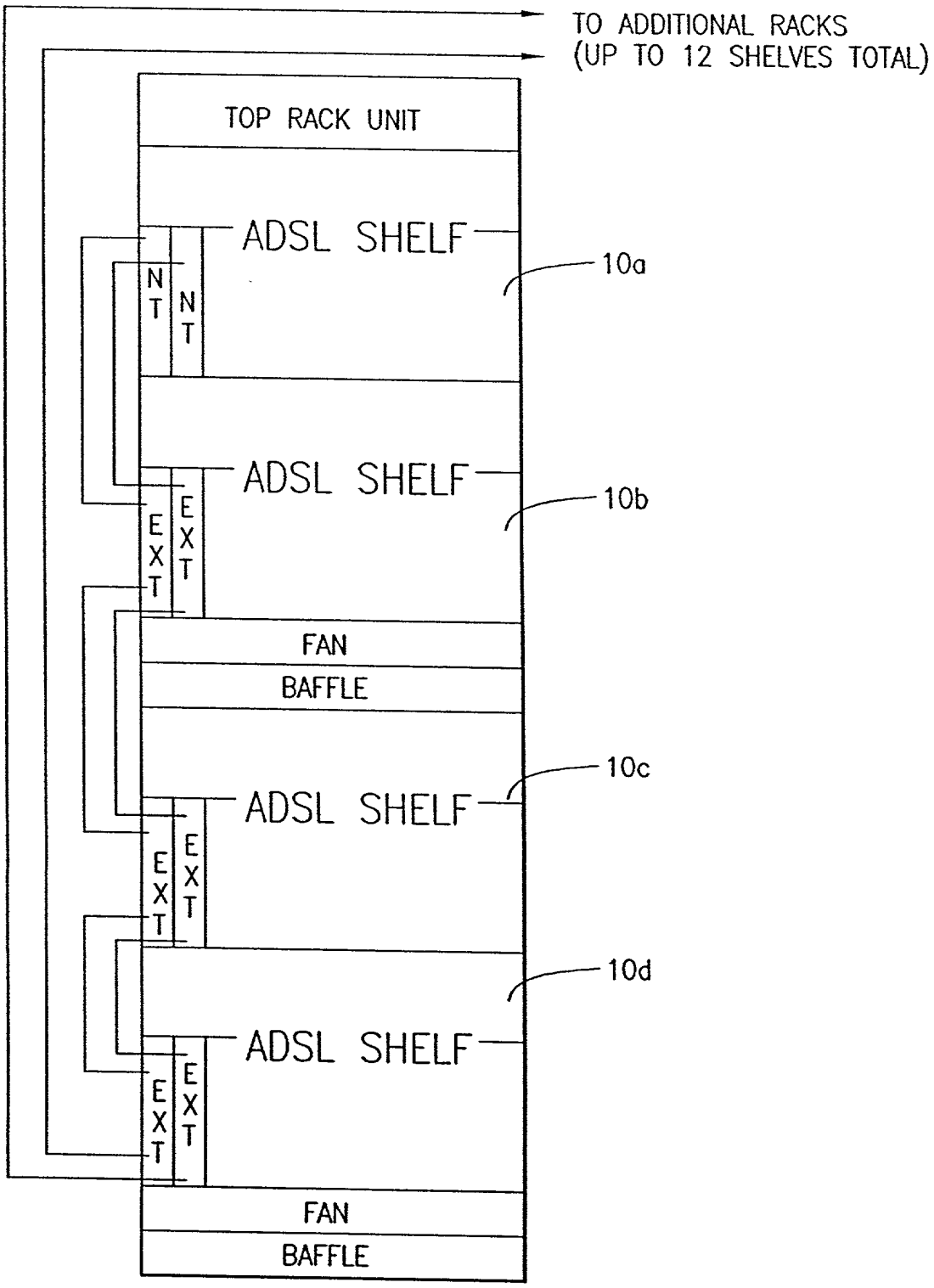

TO ADDITIONAL RACKS
(UP TO 12 SHELVES TOTAL)
TOP RACK UNIT
ADSL SHELF
10a
NT
NT
ADSL SHELF
10b
EXT
EXT
FAN
BAFFLE
ADSL SHELF
10c
EXT
EXT
10d
ADSL SHELF
EXT
EXT
FAN
BAFFLE

FIG. 7D

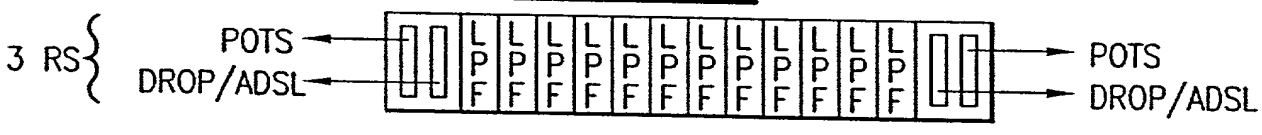

3 RS
POTS
DROP/ADSL
LPF
POTS
DROP/ADSL

FIG. 7A

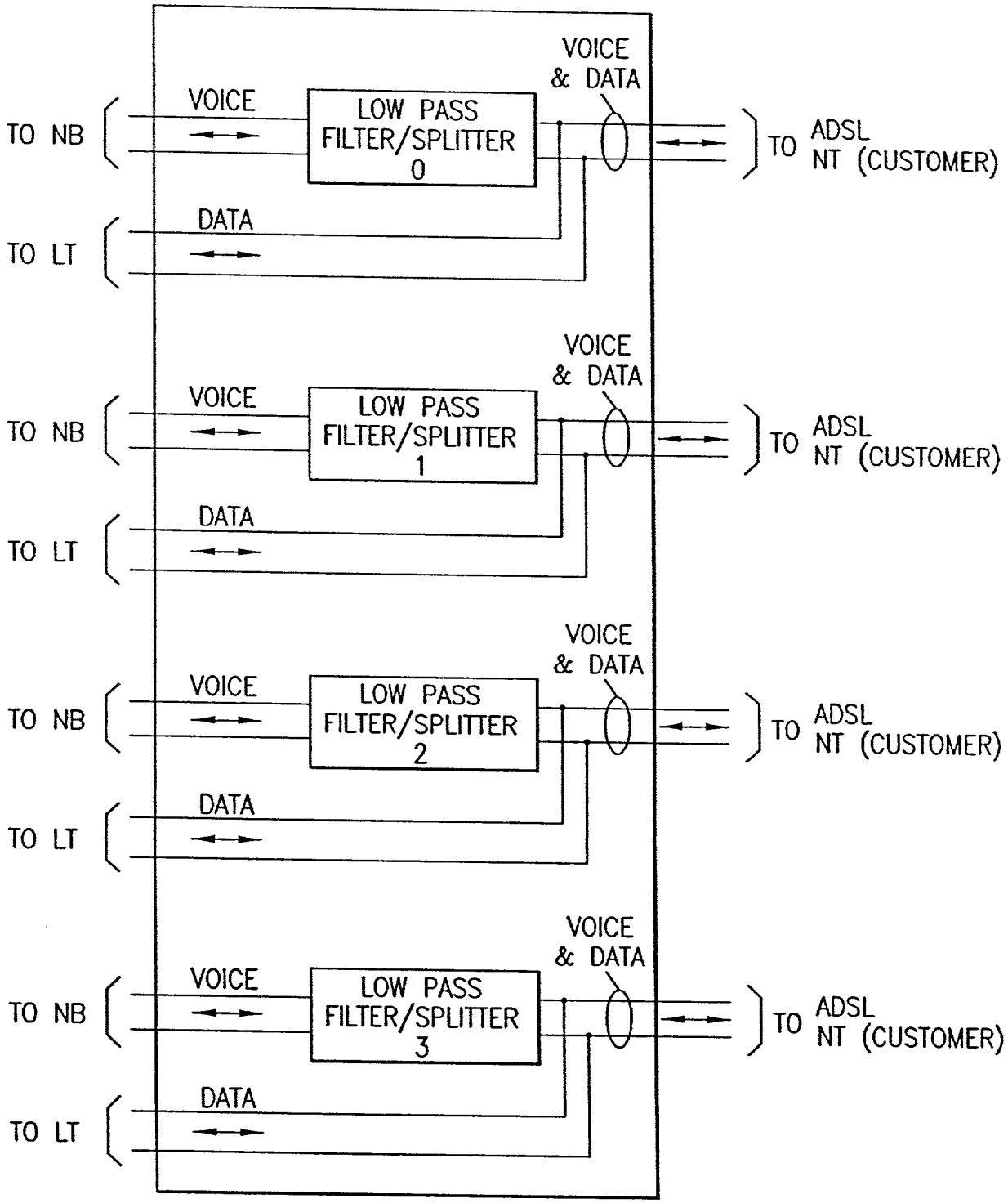

VOICE & DATA
VOICE
LOW PASS FILTER/SPLITTER 0
TO NB
DATA
TO LT
TO ADSL NT (CUSTOMER)
VOICE & DATA
VOICE
LOW PASS FILTER/SPLITTER 1
TO NB
DATA
TO LT
TO ADSL NT (CUSTOMER)
VOICE & DATA
VOICE
LOW PASS FILTER/SPLITTER 2
TO NB
DATA
TO LT
TO ADSL NT (CUSTOMER)
VOICE & DATA
VOICE
LOW PASS FILTER/SPLITTER 3
TO NB
DATA
TO LT
TO ADSL NT (CUSTOMER)

FIG. 7B

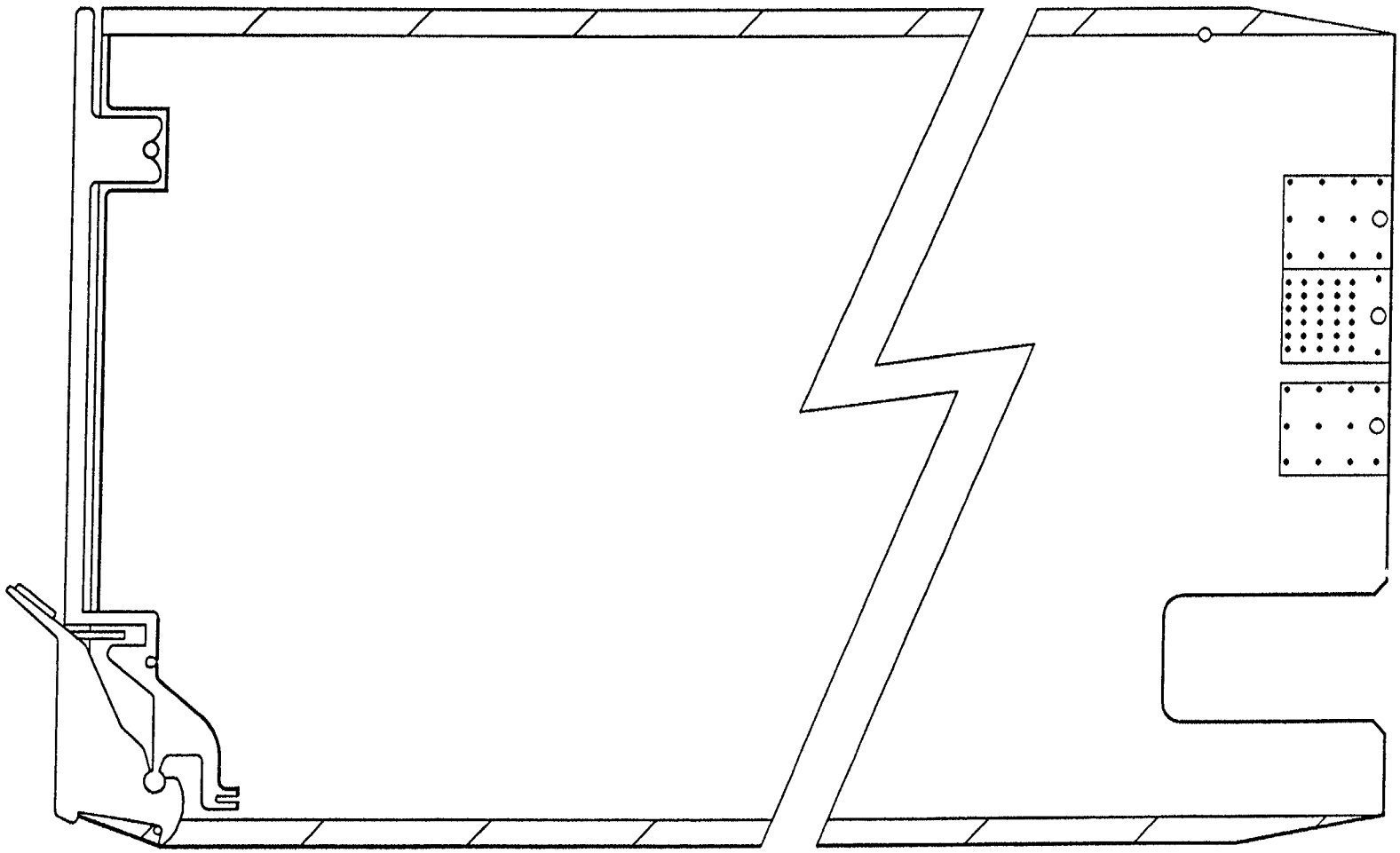


FIG. 7C

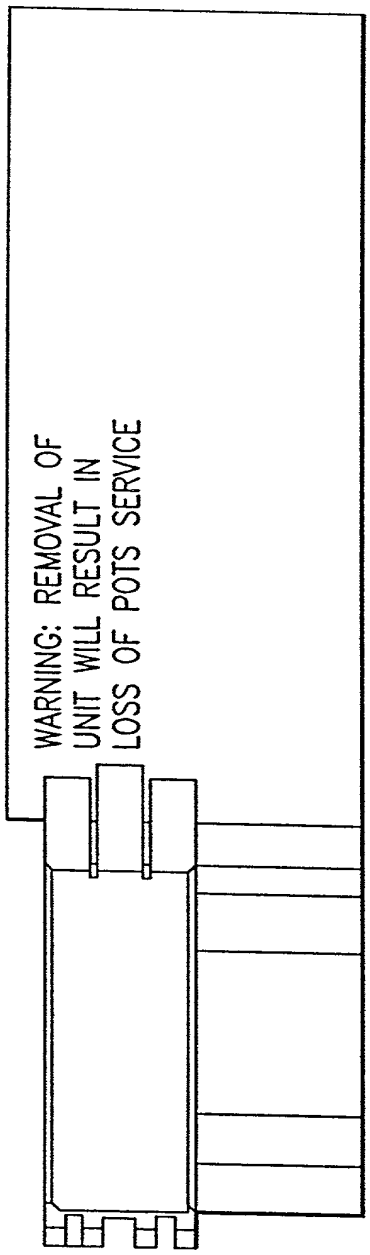


FIG. 8

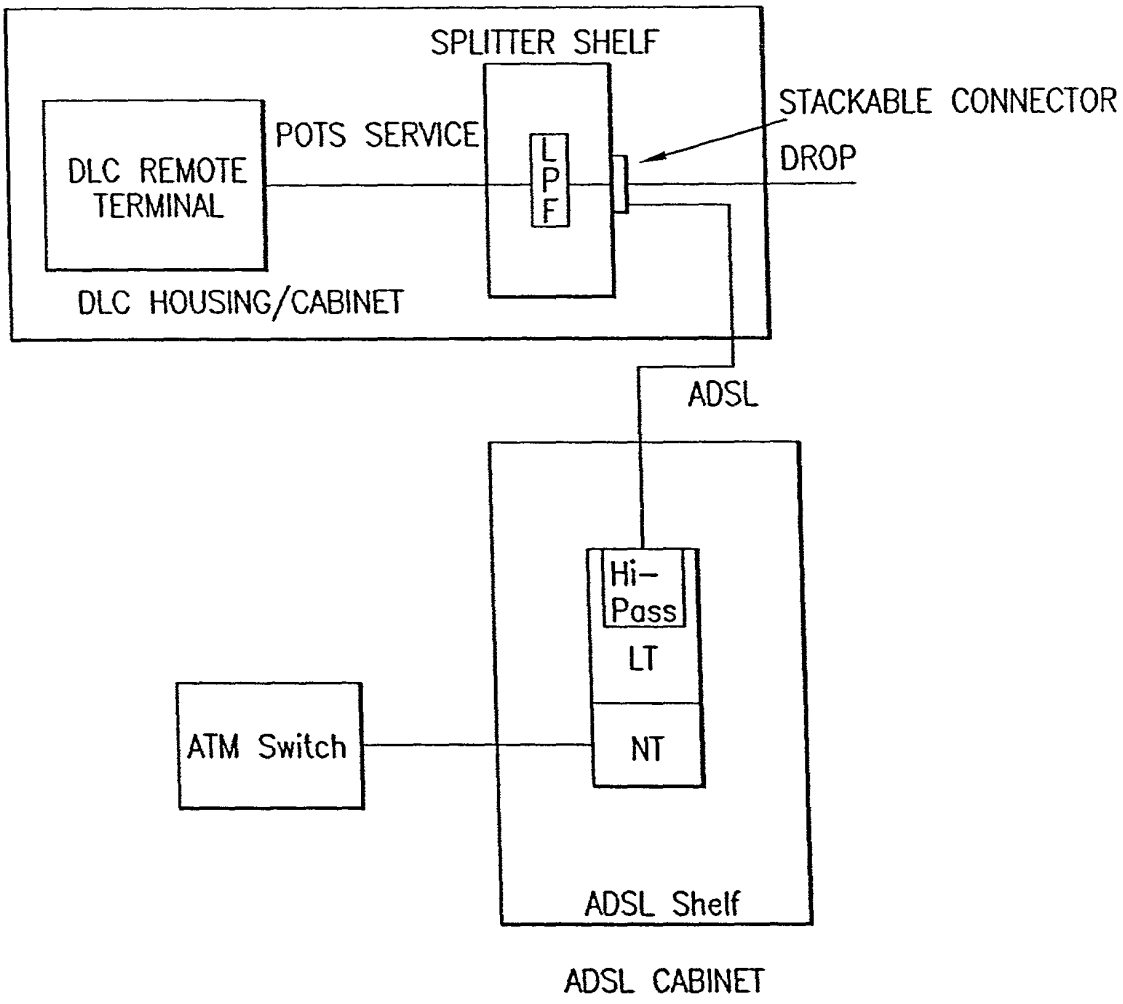


FIG. 13D

INDICATOR NAME	INDICATOR COLOR	MEANING
ATMF-25	Green	ATMF data transport activity
TX/RX	Green	Data transmit/receive
Line Error	Red	Excessive line errors-bad ADSL line
10 Base-T	Green	Ethernet data transport activity
Power/Sync.	Red	Power-on - initialization phase
	Green	Line synchronization-ready to operate

FIG. 8A

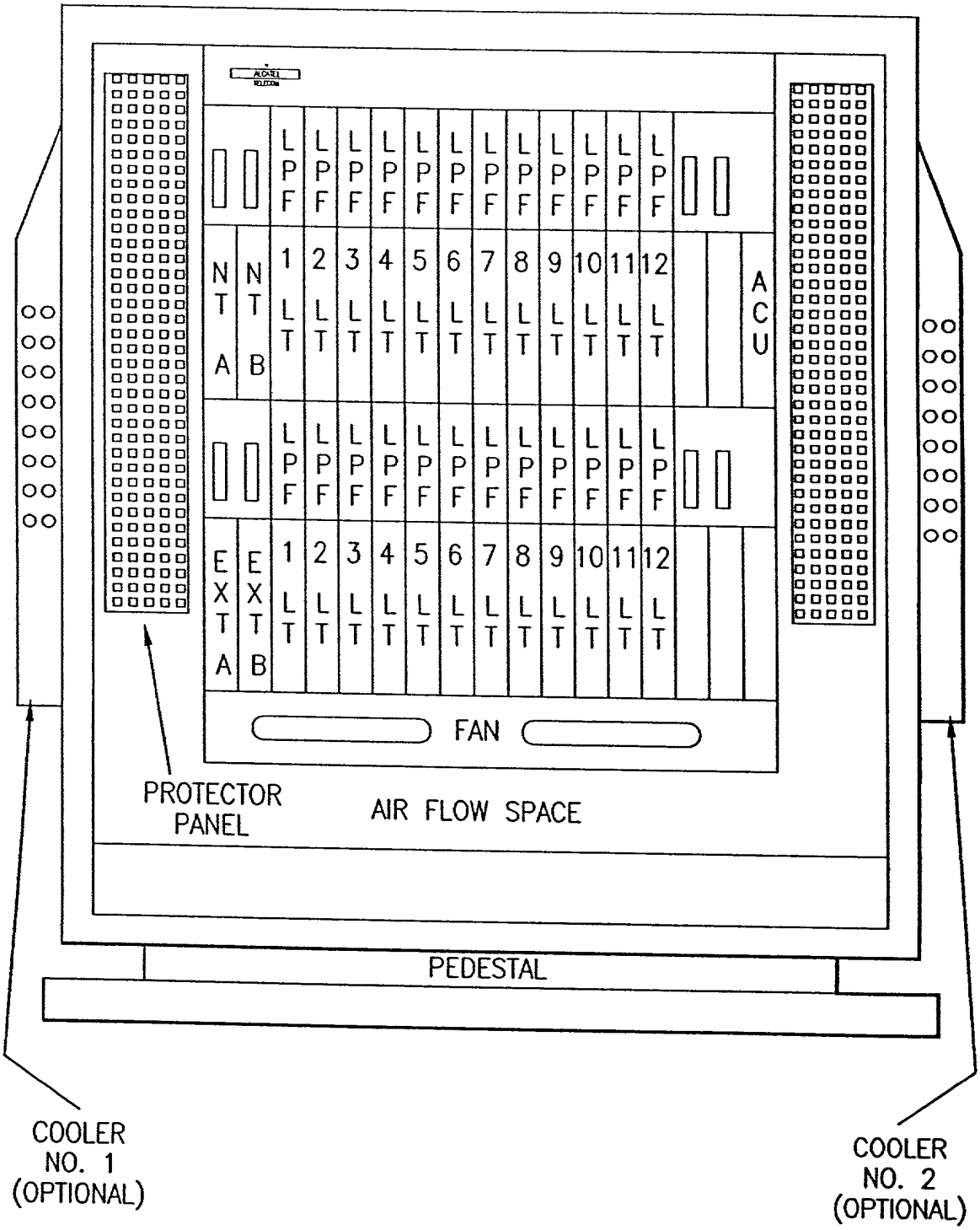
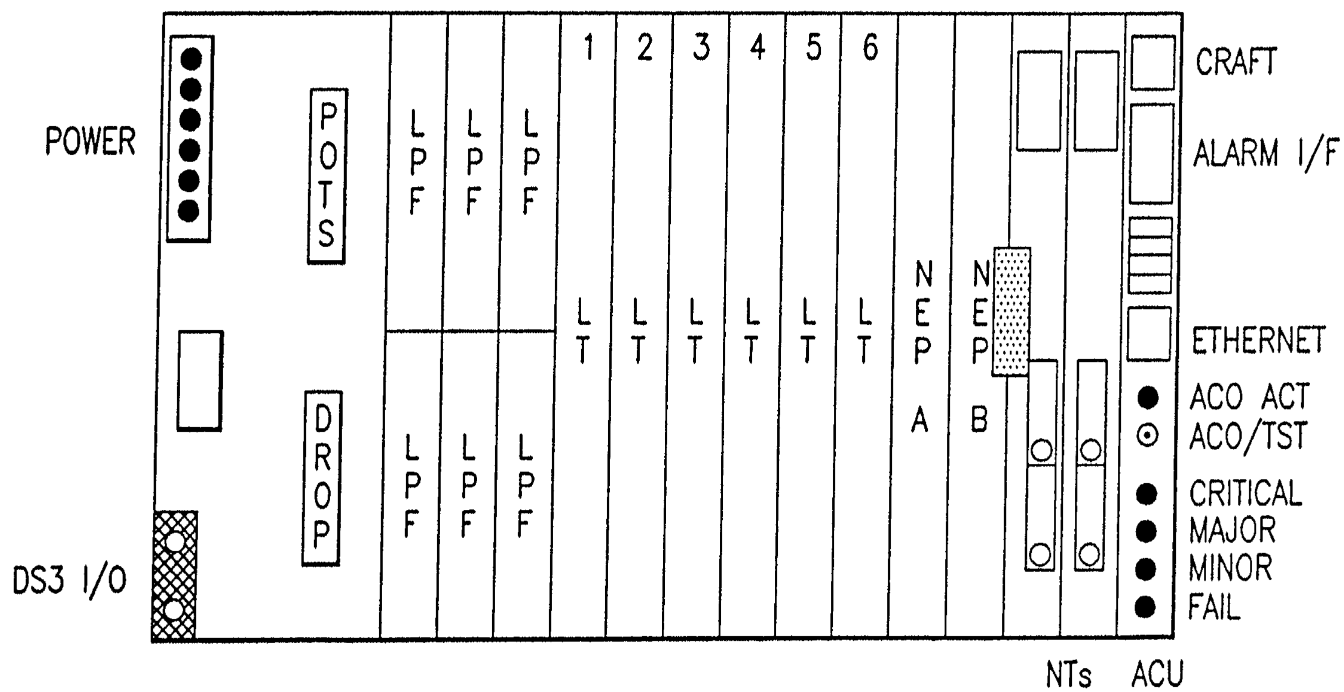
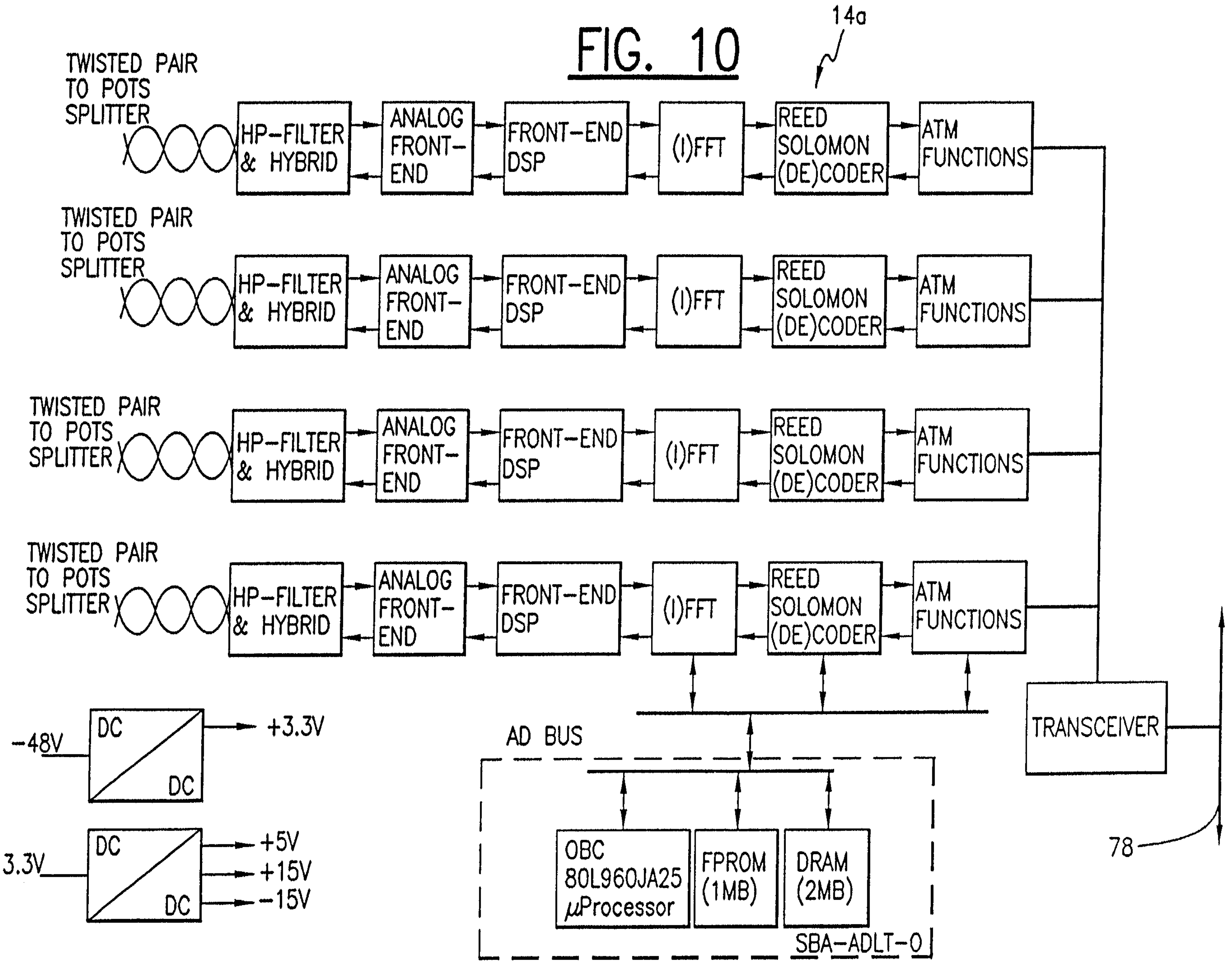

LPF
NTA
NTB
1 LT
2 LT
3 LT
4 LT
5 LT
6 LT
7 LT
8 LT
9 LT
10 LT
11 LT
12 LT
ACU
EXTA
EXTB
FAN
PROTECTOR PANEL
AIR FLOW SPACE
PEDESTAL
COOLER NO. 1 (OPTIONAL)
COOLER NO. 2 (OPTIONAL)

FIG. 9



POWER
POTS
DROP
DS3 I/O
LPF
LPF
LPF
LPF
LPF
LPF
1
2
3
4
5
6
LT
LT
LT
LT
LT
LT
NEP A
NEP B
NTs
ACU
CRAFT
ALARM I/F
ETHERNET
ACO ACT
ACO/TST
CRITICAL
MAJOR
MINOR
FAIL

FIG. 10



14a
TWISTED PAIR TO POTS SPLITTER
HP-FILTER & HYBRID
ANALOG FRONT-END
FRONT-END DSP
(I)FFT
REED SOLOMON (DE)CODER
ATM FUNCTIONS
TRANSCEIVER
78
AD BUS
OBC 80L960JA25 μProcessor
FPROM (1MB)
DRAM (2MB)
SBA-ADLT-0
-48V
DC
DC
+3.3V
3.3V
+5V
+15V
-15V

FIG. 10A

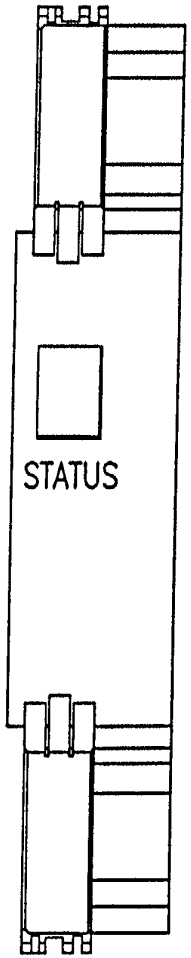


FIG. 10B

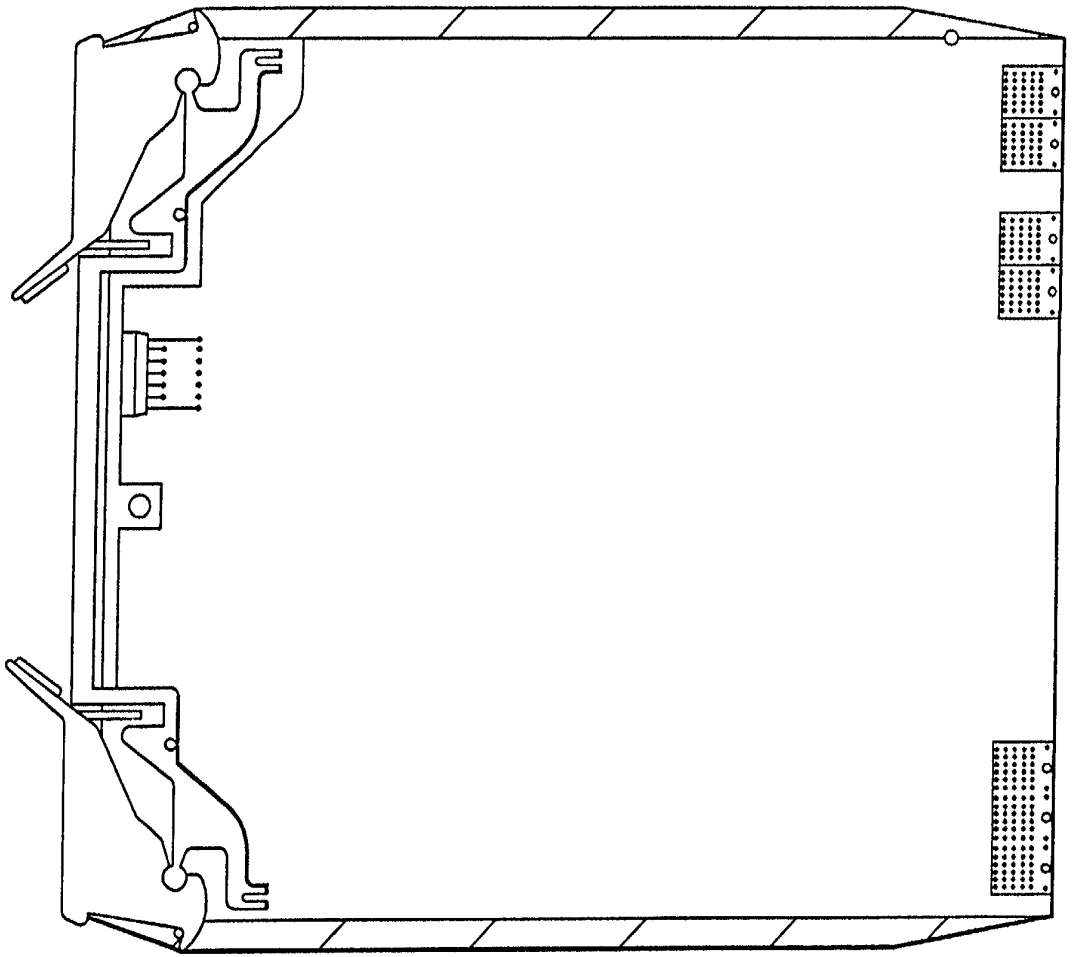


FIG. 11

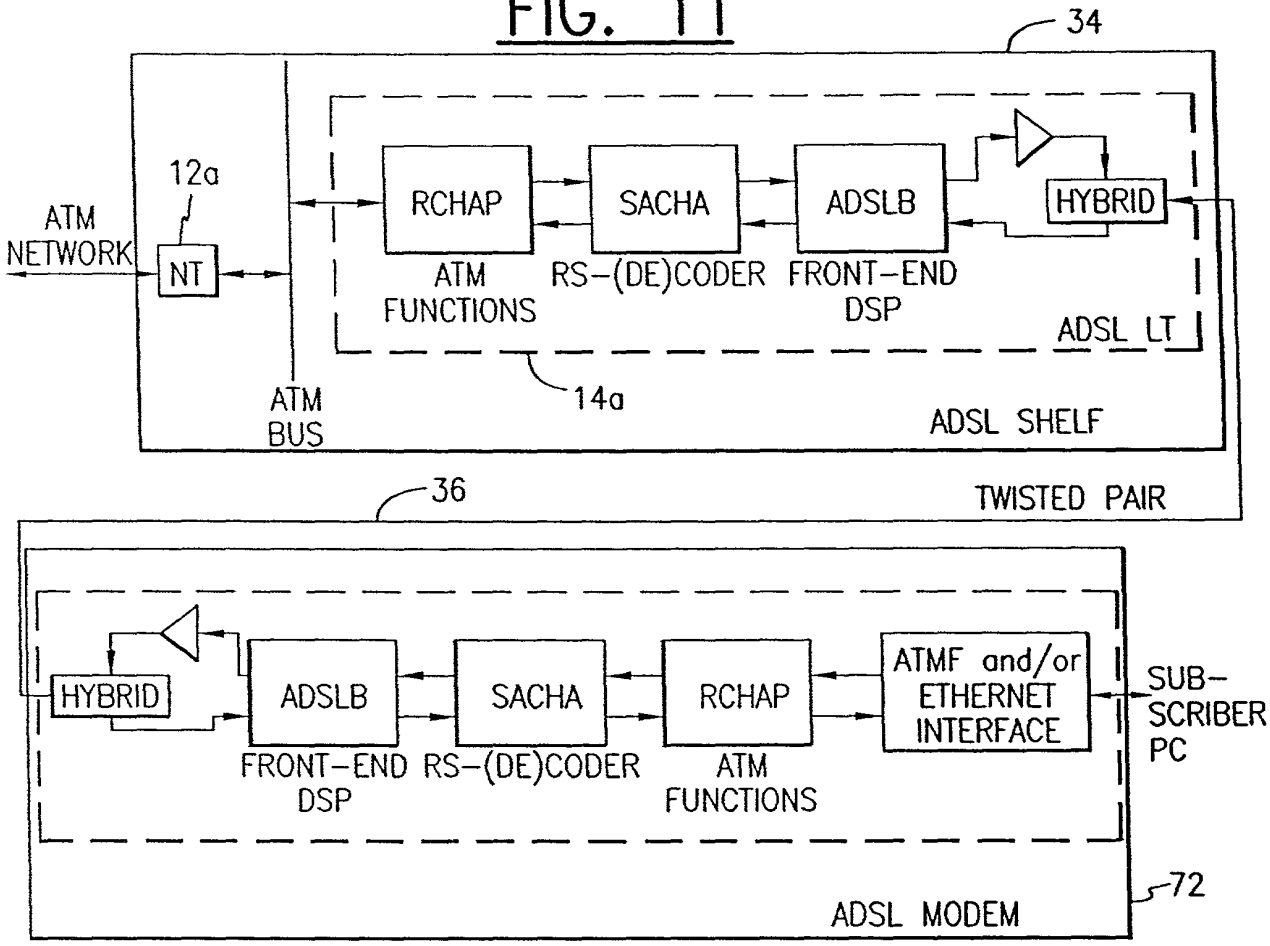

34
12a
ATM NETWORK
NT
RCHAP
SACHA
ADSLB
HYBRID
ATM FUNCTIONS
RS-(DE)CODER
FRONT-END DSP
ADSL LT
14a
ATM BUS
ADSL SHELF
TWISTED PAIR
36
HYBRID
ADSLB
SACHA
RCHAP
ATMF and/or ETHERNET INTERFACE
SUB-SCRIBER PC
FRONT-END DSP
RS-(DE)CODER
ATM FUNCTIONS
ADSL MODEM
72

FIG. 12

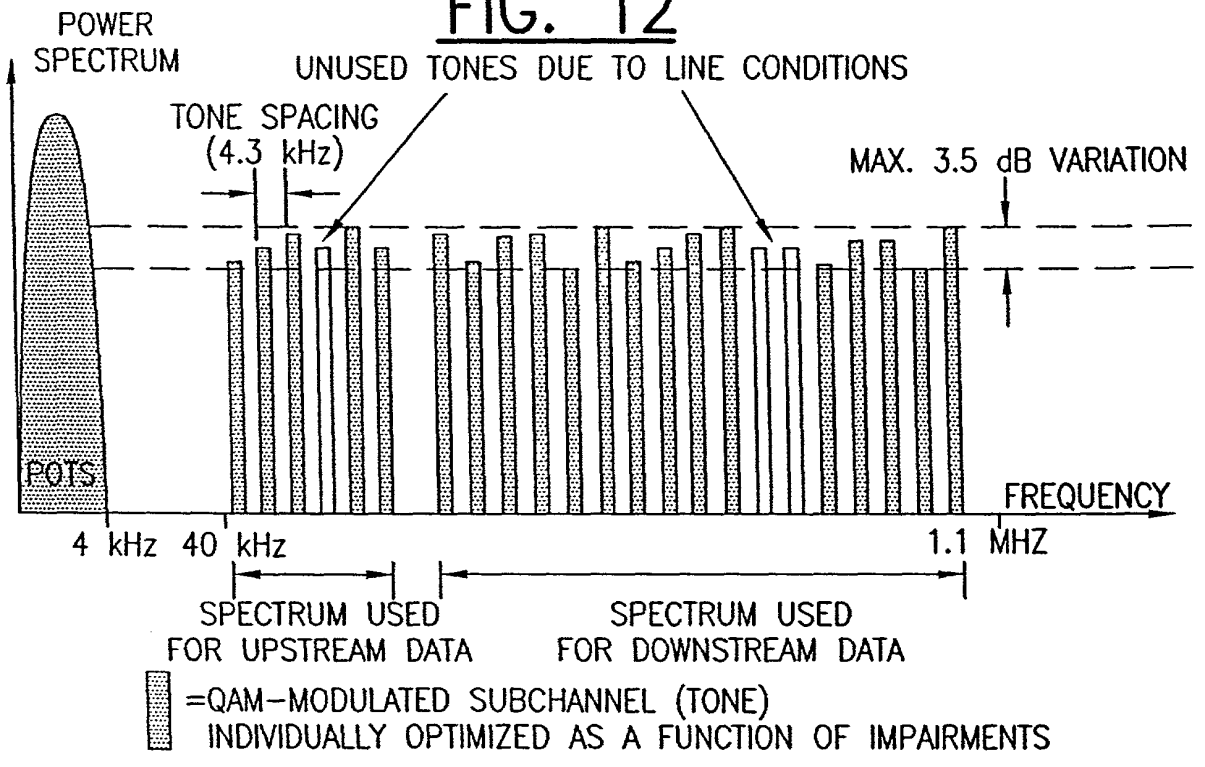

POWER SPECTRUM
UNUSED TONES DUE TO LINE CONDITIONS
TONE SPACING (4.3 kHz)
MAX. 3.5 dB VARIATION
POTS
FREQUENCY
4 kHz
40 kHz
1.1 MHZ
SPECTRUM USED FOR UPSTREAM DATA
SPECTRUM USED FOR DOWNSTREAM DATA
=QAM-MODULATED SUBCHANNEL (TONE)
INDIVIDUALLY OPTIMIZED AS A FUNCTION OF IMPAIRMENTS

FIG. 13A

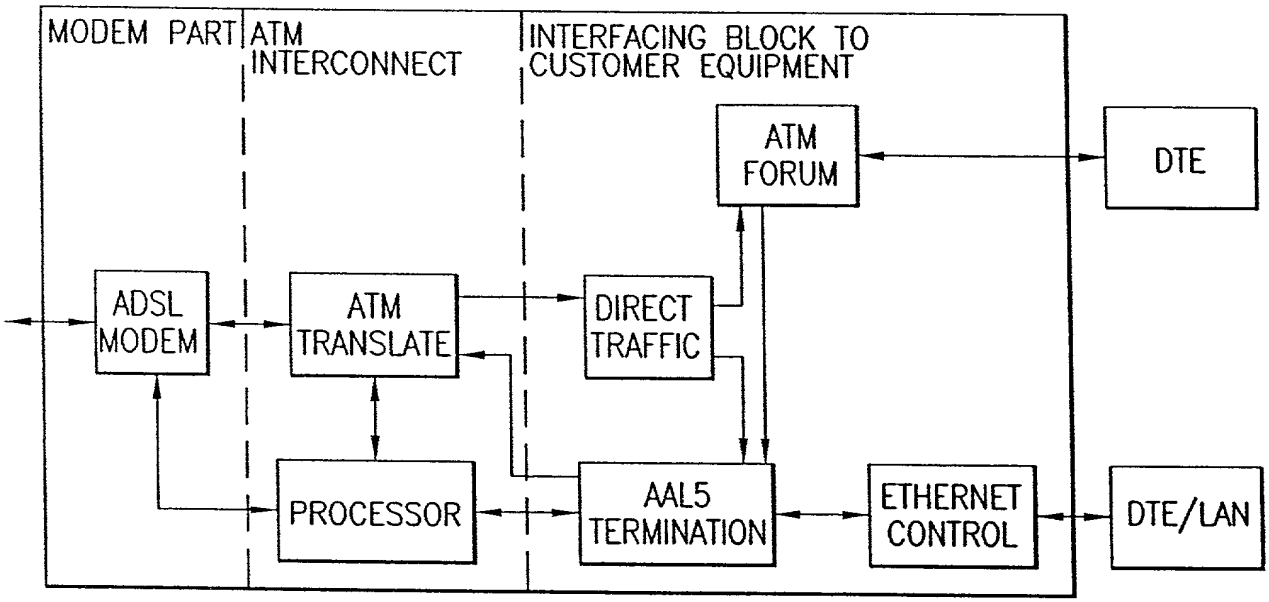


FIG. 13B

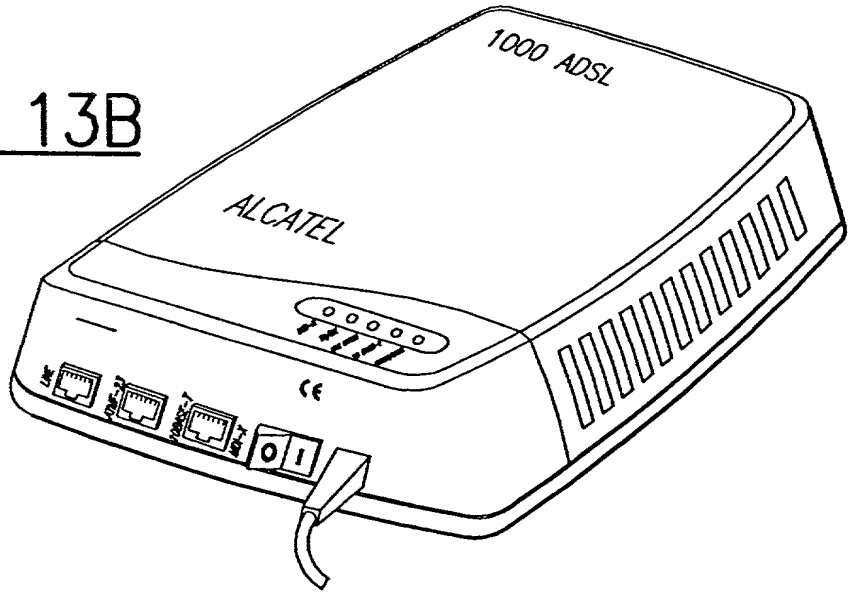


FIG. 13C

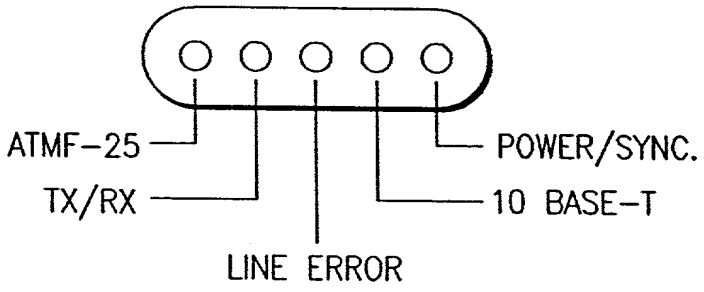


FIG. 13E

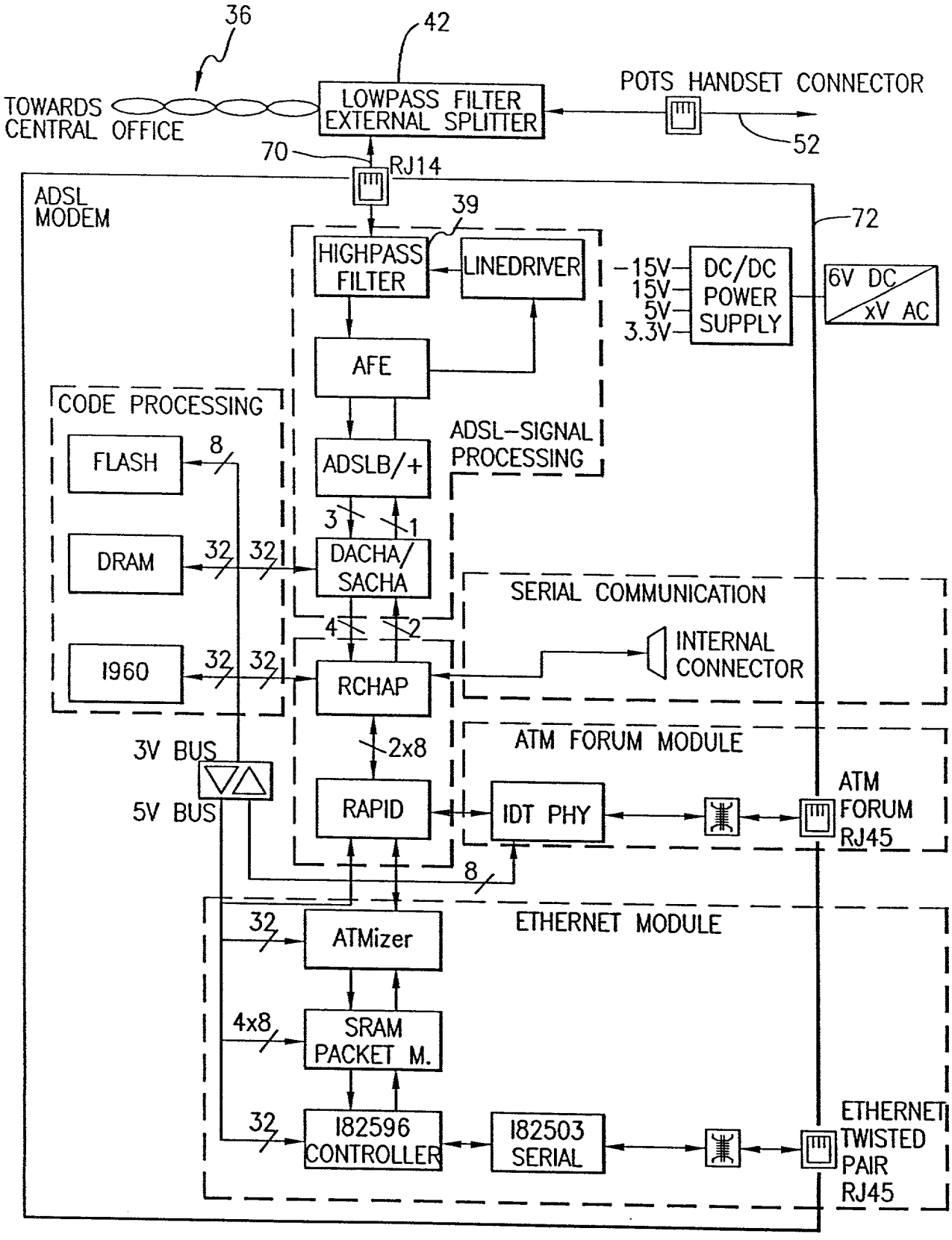

36
42
TOWARDS CENTRAL OFFICE
LOWPASS FILTER EXTERNAL SPLITTER
POTS HANDSET CONNECTOR
52
70
RJ14
ADSL MODEM
39
72
HIGHPASS FILTER
LINEDRIVER
-15V
15V
5V
3.3V
DC/DC POWER SUPPLY
6V DC
xV AC
AFE
CODE PROCESSING
ADSL-SIGNAL PROCESSING
FLASH
8
ADSLB/+
3
1
DRAM
32
32
DACHA/ SACHA
SERIAL COMMUNICATION
4
2
INTERNAL CONNECTOR
I960
32
32
RCHAP
3V BUS
5V BUS
2x8
ATM FORUM MODULE
RAPID
IDT PHY
ATM FORUM RJ45
8
ETHERNET MODULE
32
ATMizer
4x8
SRAM PACKET M.
32
I82596 CONTROLLER
I82503 SERIAL
ETHERNET TWISTED PAIR RJ45

FIG. 14B

	DOWNSTREAM† FUNCTIONS	UPSTREAM† FUNCTIONS	
①	Optical interface	Reading ATM cells from the ATM interface (IQ BUS)	⑤
①	Locking on received clock	ATM cell extraction	⑥
①	Serial to parallel conversion	ATM cell insertion	⑥
②	STM1/STS3c frame alignment recovery	ATM layer processing plus cell rate decoupling	⑥
②	STM1/STS3c descrambling	ATM cell Header Error Control (HEC) calculation	⑥
②	F1, F2, or F3 OAM functions	ATM cell payload scrambling	⑥
②	ATM cell delineation (in virtual container type 4s)	Mapping of ATM cells in virtual container type 4s	⑦
③	ATM cell HEC checking	F1, F2, or F3 OAM functions	⑦
③	ATM cell payload descrambling	STM1/STS3c scrambling	⑦
③	ATM layer processing plus cell rate decoupling	STM1/STS3c frame generation	⑦
③	ATM cell extraction	Parallel to serial conversion	⑧
③	ATM cell insertion	Produce transmit clock out of recieved clock or local oscillator	⑧
④	Provision of access to the ATM IQ bus	Optical interface	⑧

Note †Upstream is in the direction of the transport system and downstream is in the direction of the ATM IQ interface.

FIG. 14A

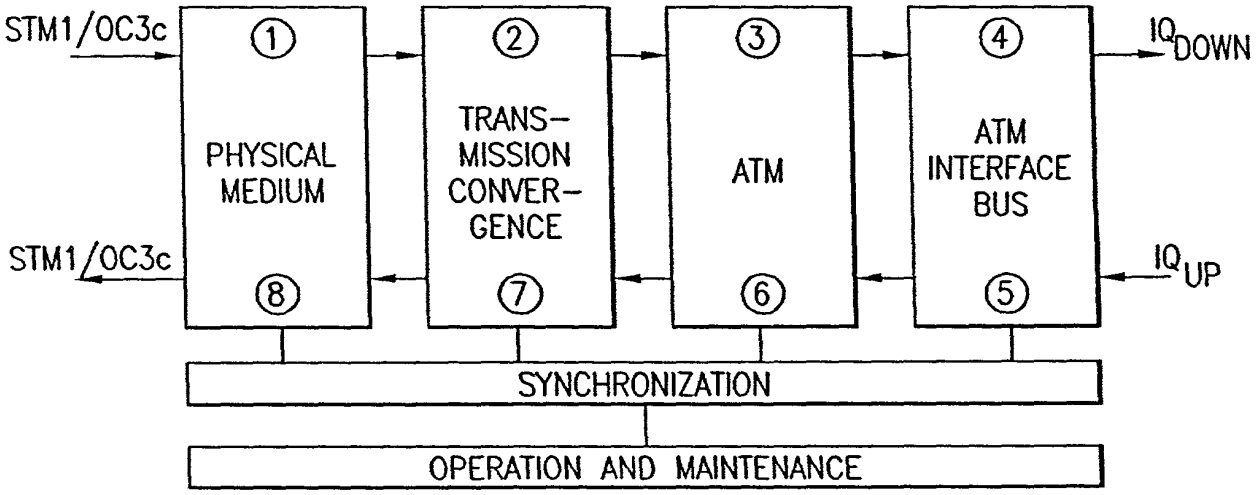


FIG. 14C

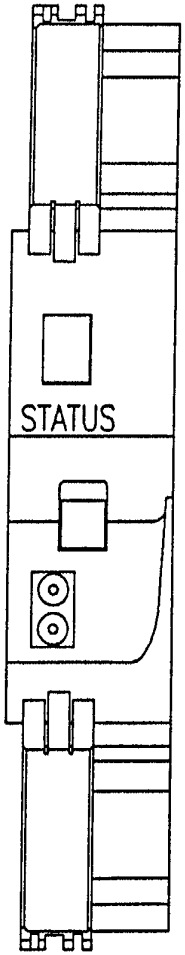


FIG. 14D

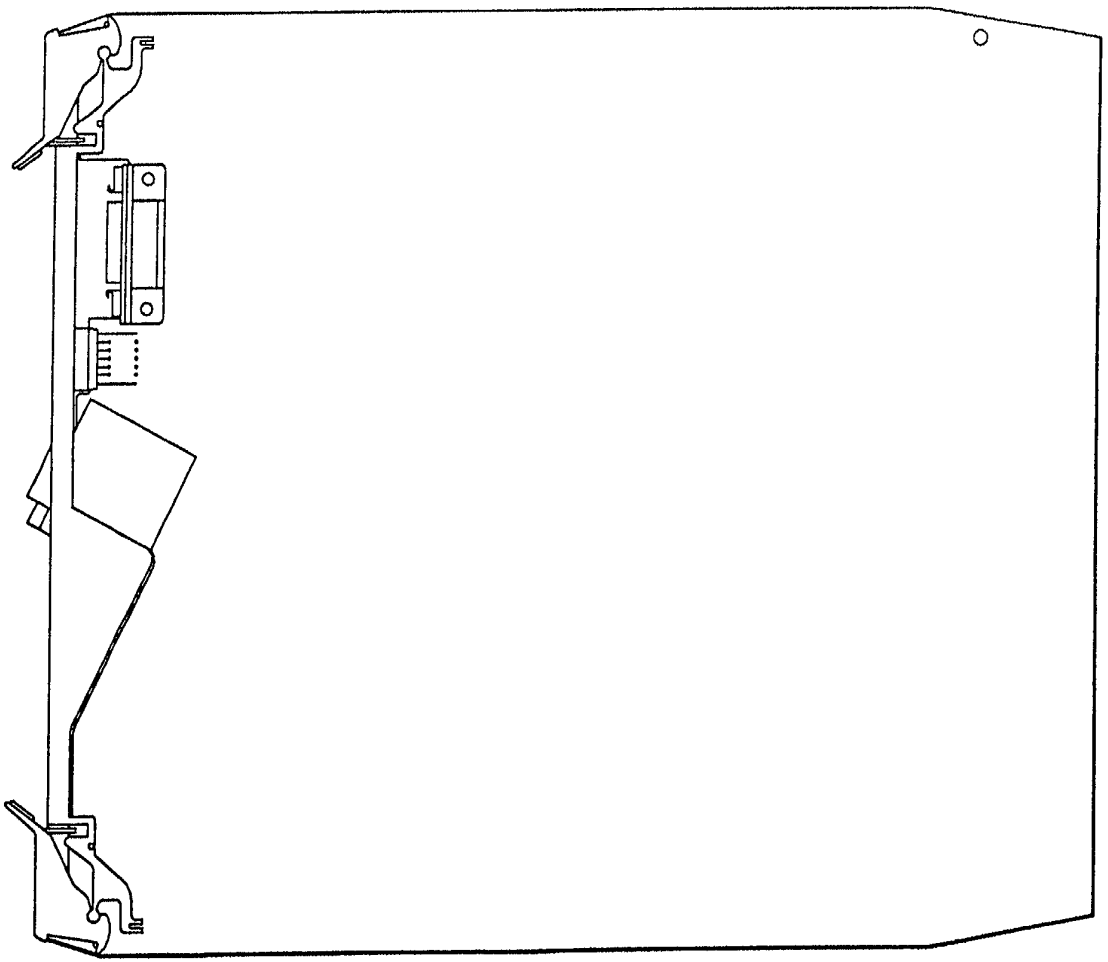


FIG. 14E

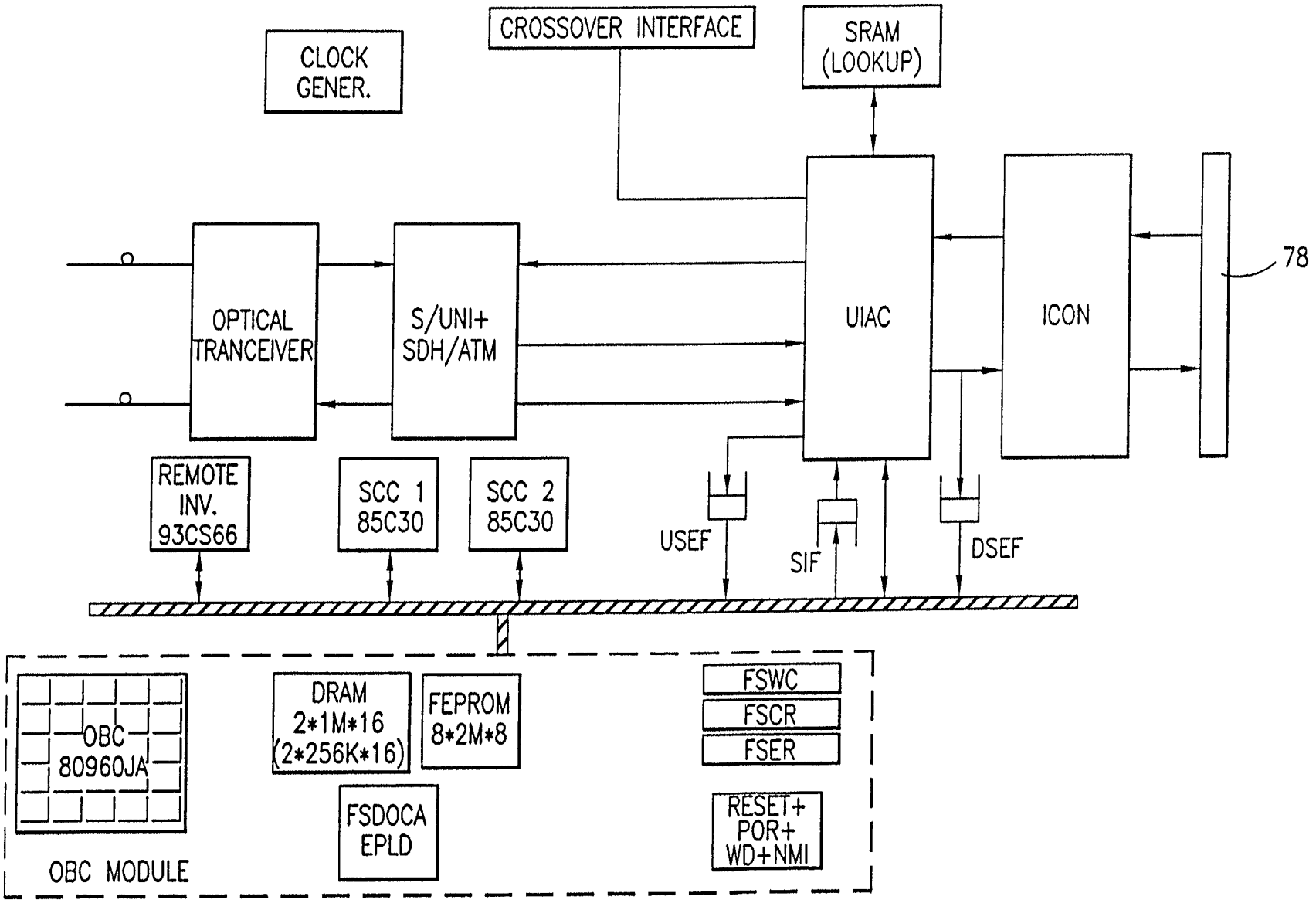


FIG. 14F

7	6	5	4	3	2	1	0	BIT/OCTET
GFC(*)				VPI				1
VPI				VCI				2
VCI								3
VCI				PTI		CLP		4
HEC								5

FIG. 14G

VPI			VCI				MODE
#3	#2	#1	#4	#3	#2	#1	
X	X	X			X		NNI
	X	X			X	X	UNI 1
		X		X	X	X	UNI 2

FIG. 14H

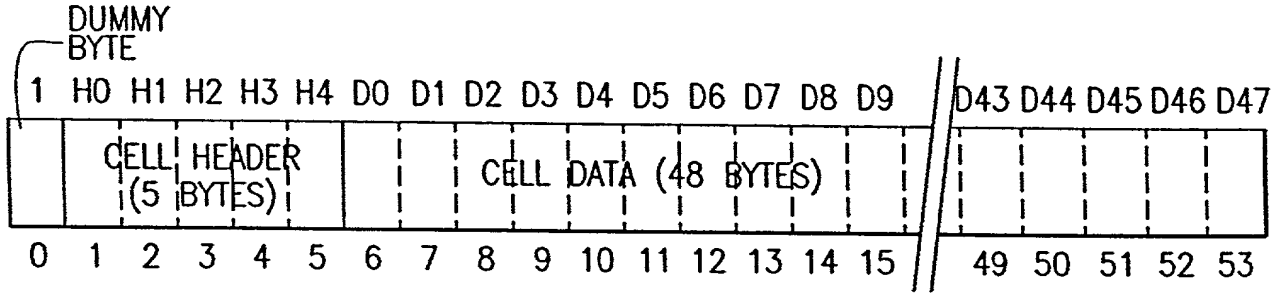


FIG. 15A

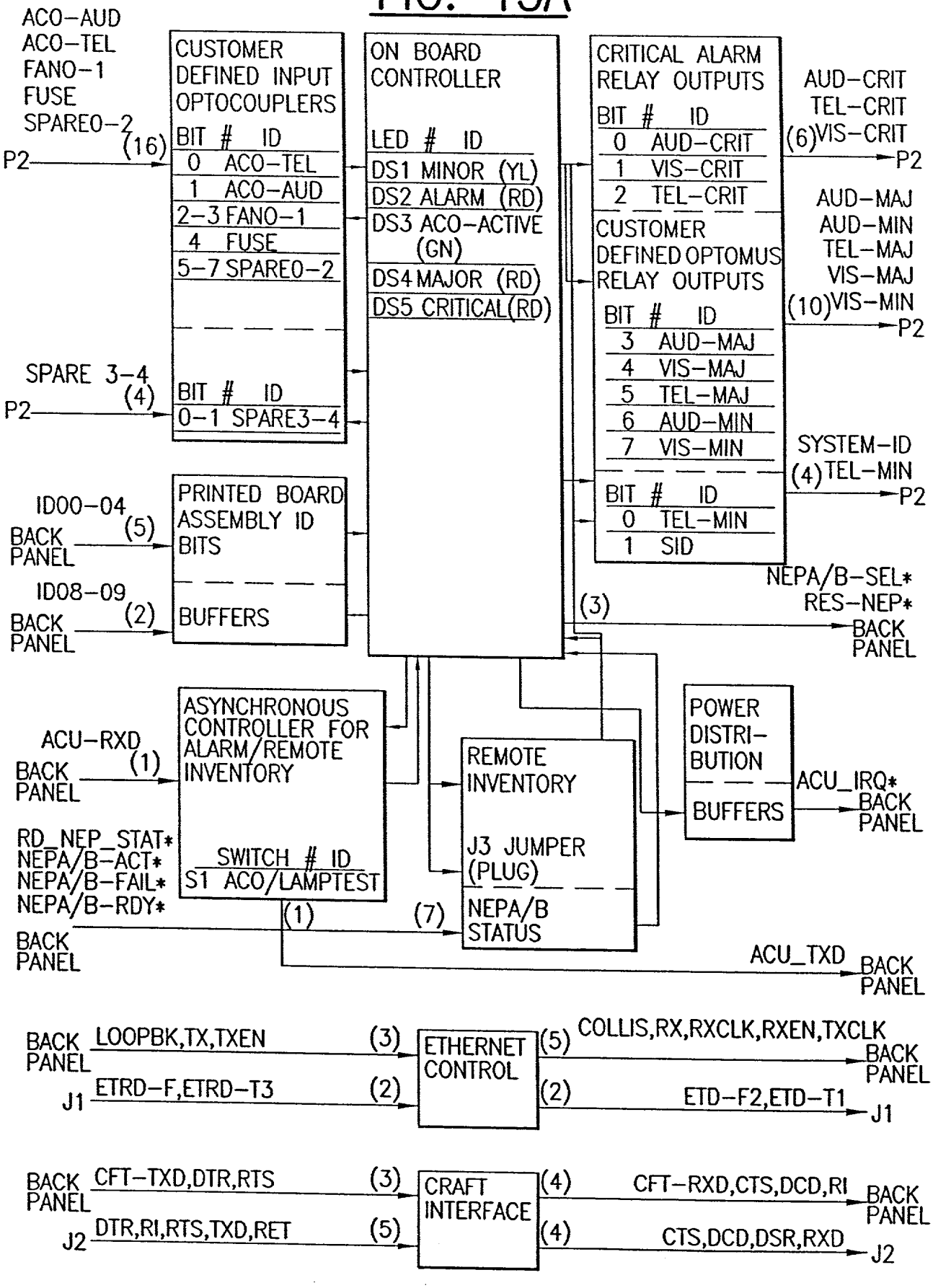

ACO–AUD
ACO–TEL
FANO–1
FUSE
SPARE0–2
(16)
P2
CUSTOMER DEFINED INPUT OPTOCOUPLERS
BIT # ID
0 ACO–TEL
1 ACO–AUD
2–3 FANO–1
4 FUSE
5–7 SPARE0–2
SPARE 3–4
(4)
P2
BIT # ID
0–1 SPARE3–4
ON BOARD CONTROLLER
LED # ID
DS1 MINOR (YL)
DS2 ALARM (RD)
DS3 ACO–ACTIVE (GN)
DS4 MAJOR (RD)
DS5 CRITICAL(RD)
CRITICAL ALARM RELAY OUTPUTS
BIT # ID
0 AUD–CRIT
1 VIS–CRIT
2 TEL–CRIT
CUSTOMER DEFINED OPTOMUS RELAY OUTPUTS
BIT # ID
3 AUD–MAJ
4 VIS–MAJ
5 TEL–MAJ
6 AUD–MIN
7 VIS–MIN
BIT # ID
0 TEL–MIN
1 SID
AUD–CRIT
TEL–CRIT
(6) VIS–CRIT
P2
AUD–MAJ
AUD–MIN
TEL–MAJ
VIS–MAJ
(10) VIS–MIN
P2
SYSTEM–ID
(4) TEL–MIN
P2
NEPA/B–SEL*
RES–NEP*
(3)
BACK PANEL
ID00–04
BACK PANEL
(5)
ID08–09
BACK PANEL
(2)
PRINTED BOARD ASSEMBLY ID BITS
BUFFERS
ACU–RXD
BACK PANEL
(1)
ASYNCHRONOUS CONTROLLER FOR ALARM/REMOTE INVENTORY
SWITCH # ID
S1 ACO/LAMPTEST
RD_NEP_STAT*
NEPA/B–ACT*
NEPA/B–FAIL*
NEPA/B–RDY*
BACK PANEL
(1)
(7)
REMOTE INVENTORY
J3 JUMPER (PLUG)
NEPA/B STATUS
POWER DISTRI–BUTION
BUFFERS
ACU_IRQ*
BACK PANEL
ACU_TXD
BACK PANEL
BACK PANEL
LOOPBK,TX,TXEN
(3)
J1
ETRD–F,ETRD–T3
(2)
ETHERNET CONTROL
(5)
COLLIS,RX,RXCLK,RXEN,TXCLK
BACK PANEL
(2)
ETD–F2,ETD–T1
J1
BACK PANEL
CFT–TXD,DTR,RTS
(3)
J2
DTR,RI,RTS,TXD,RET
(5)
CRAFT INTERFACE
(4)
CFT–RXD,CTS,DCD,RI
BACK PANEL
(4)
CTS,DCD,DSR,RXD
J2

FIG. 15B

Item Number	Function Description
1	Provides a central office alarm interface
2	Provides a telemetry alarm interface
3	Collects up to 2 rack fan alarms, 1 Top Rack Unit (TRU) fuse alarm, 5 miscellaneous external alarms, 1 Alarm Cut-Off Audible Unit (ACO_AU) alarm, and 1 ACO Telemetry (ACO_TEL) alarm
4	Provides local craft terminal port
5	Provides an ethernet port (future option)
6	Provides a visual summary alarm display of rack minor, major, and critical alarm conditions
7	Provides a local Alarm Cut-Off (ACO) for Central Office (CO) alarms and a visual display of the ACO status
8	Provides a unit failure indicator
9	Provides a craft port for an asynchronous EIA-232-D function available to the user via a female 9-pin subminiature D connector on the front panel of the ACU
10	Handles input/output alarm information and generates alarm status/indicators via relay contacts or optical switches and Light Emitting Diodes (LEDs) for audible/visual/telemetry
11	Provides for a remote inventory function
12	Provides for Network Element Processor A (NEPA)/NEPB active/standby arbitration (future option)
13	Provides for NEPA/NEPB reset function (future option)
14	Provides for Joint Test Access Group (JTAG)/boundary scan testing

Note There is only one active craft port per ADSL system.

Note The backplane has 5 Identifier (ID) bits dedicated for slot information that are read to check for proper slot insertion (ie., each slot has a unique address).

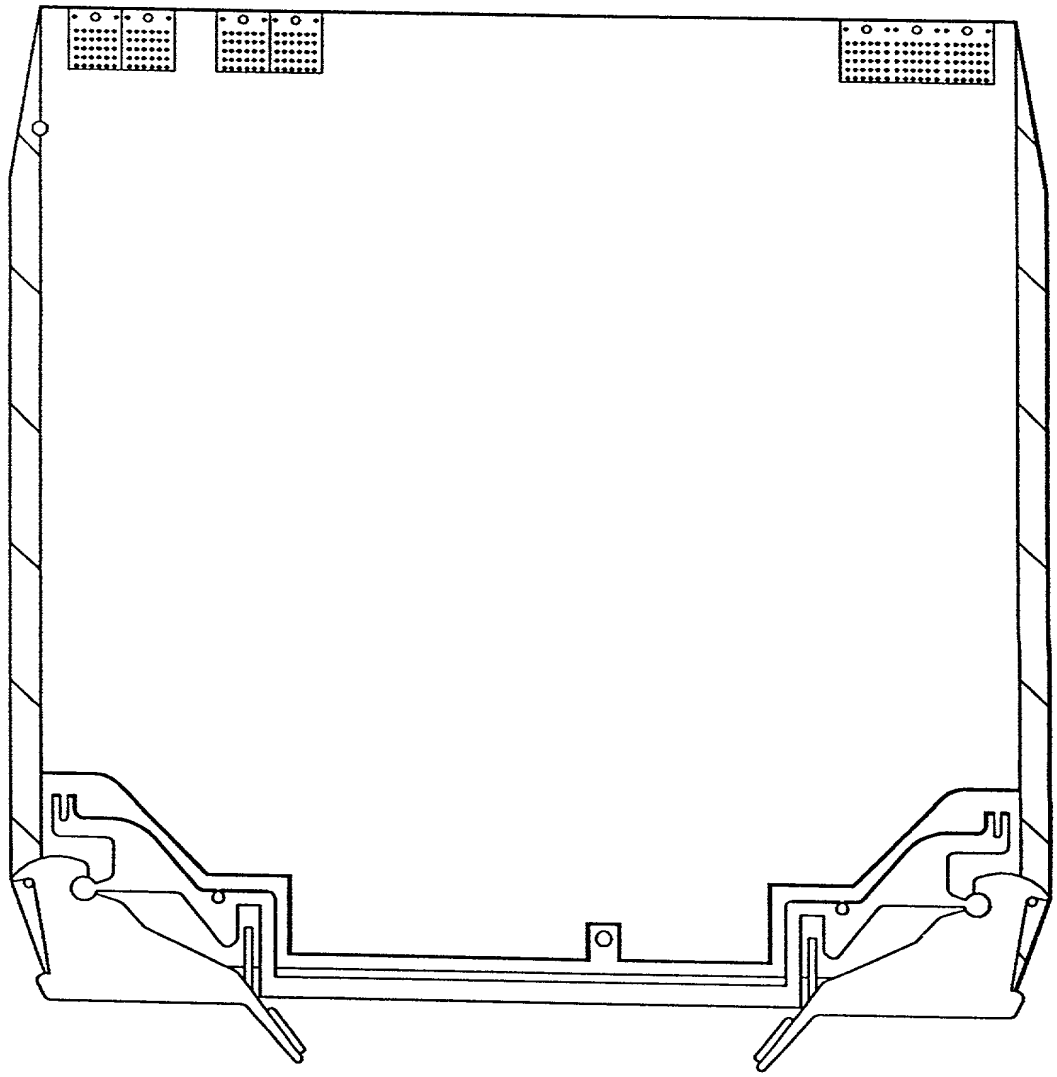


FIG. 17

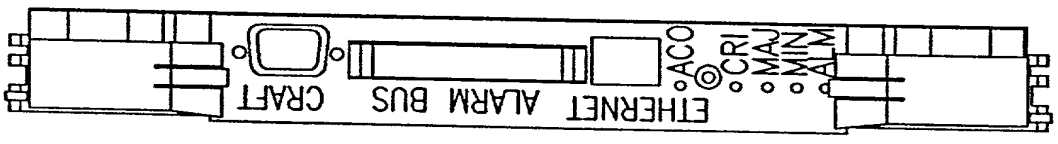


FIG. 16